



2 | *The Antebellum City* 1800–65

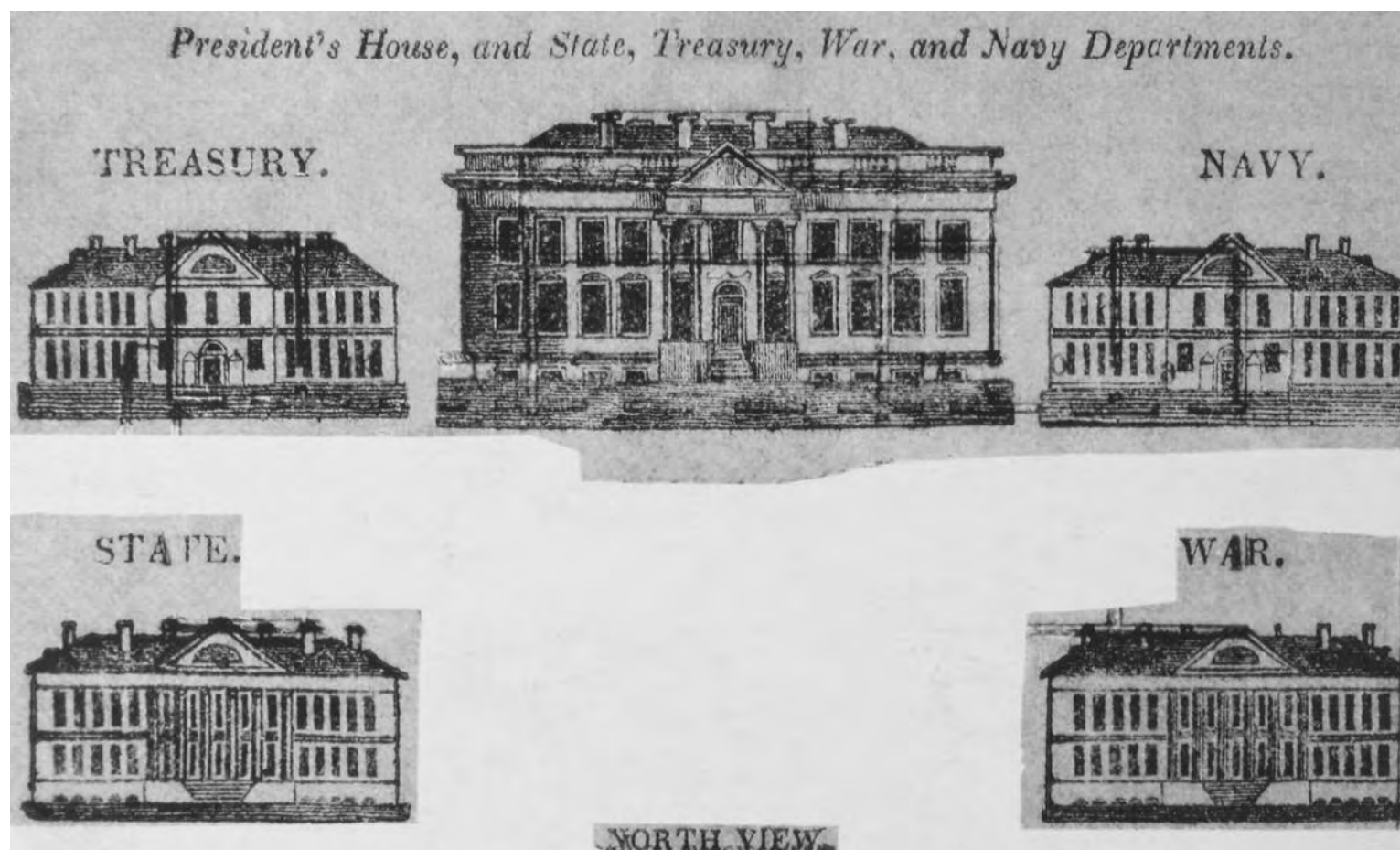
THE FEDERAL GOVERNMENT MOVES TO WASHINGTON, 1800

In 1800 the three branches of the federal government moved in stages from Philadelphia to Washington. The 1790 Residence Act required Congress to convene in the Federal City on the third Monday in November 1800, but in May, President John Adams ordered the executive departments to be open for business by June 15, 1800. Secretary of War Samuel Dexter had four clerks and a messenger, while the accountant for the War Department had ten clerks and a messenger out of the government's 130 full-time employees. Because the War Department's designated building was not yet finished, it leased Joseph Hodgson's brick building on the south side of Pennsylvania Avenue between 21st and 22nd Streets. On November 8, 1800, most of the department's records were lost when the building was destroyed by fire.¹

In 1798 the English-born and -trained architect George Hadfield designed a standardized office building for the Treasury Department on the east of the president's house and the War Department on the west side. The Treasury Department's building was

*OPPOSITE PAGE: CAPITOL DOME
ENLARGEMENT, CA. 1861–62*

Office of History, Corps of Engineers



The four executive department buildings in the 1820s. The Corps of Engineers' headquarters was located in the War Department Building west of the president's house.

Washingtoniana Division, D.C. Public Library

completed first because it was the largest executive department with sixty-nine employees. On August 6, 1799, Maryland builder Leonard Harbaugh contracted to erect the War Department building at the corner of 17th Street and Pennsylvania Avenue for \$39,511. It was finished in late 1800 or early 1801 and its twenty-four rooms were occupied by both the War and Navy Departments until 1819 (except for the two years when it was being rebuilt after being burned by the British on August 24, 1814). The Navy Department moved into the former War Department, which occupied a new, larger building at the corner of 17th Street and Pennsylvania Avenue in 1819.²

The legislation that appropriated monies for the government's move to Washington authorized \$10,000 to be spent by the four cabinet secretaries to pave streets in the embryonic city, establishing the precedent for the cabinet officers sharing responsibility in carrying out congressional mandates concerning the city's physical development. House and Senate Committees on Public Buildings and Grounds, the Library, and the District of Columbia decided what measures needed to be taken in developing Washington's public spaces and securing designs for the public buildings. Initially, as was the case with James Hoban and the president's house, architects also superintended

construction. With complex buildings, such as the U.S. Capitol, and the emergence of architecture and engineering as separate intellectual professions—exemplified by the arrival on the scene of the British-born and pan-European-educated architect-engineer B. H. Latrobe (1764–1820)—the need to divide design and construction superintendence to ensure building craftsmanship became evident. Latrobe educated apprentice architects in the first decade of the nineteenth century to carry on his conviction that the intellectual aspects of architecture were separate from the work of America’s eighteenth century builder-architects, such as William Buckland, whose work in the Chesapeake Bay region was, and is, admired.³

THE MILITARY ACADEMY AT WEST POINT AND THE CORPS

Although the Corps of Engineers eventually played the leading role in managing the building of Washington, this responsibility evolved slowly during the first half of the nineteenth century. When the Continental Congress established the Continental Army on June 16, 1775, a Chief Engineer was among its ranking officers. As early as September 20, 1776, the Continental Congress appointed a committee who resolved that “the Board of War be directed to prepare a Continental Laboratory, and a Military Academy, and provide the same with proper Officers.”⁴ In 1783 at the end of the Revolution, most of the U.S. Army, including the Corps of Engineers, was disbanded, with only a small contingent left headquartered at West Point, New York.

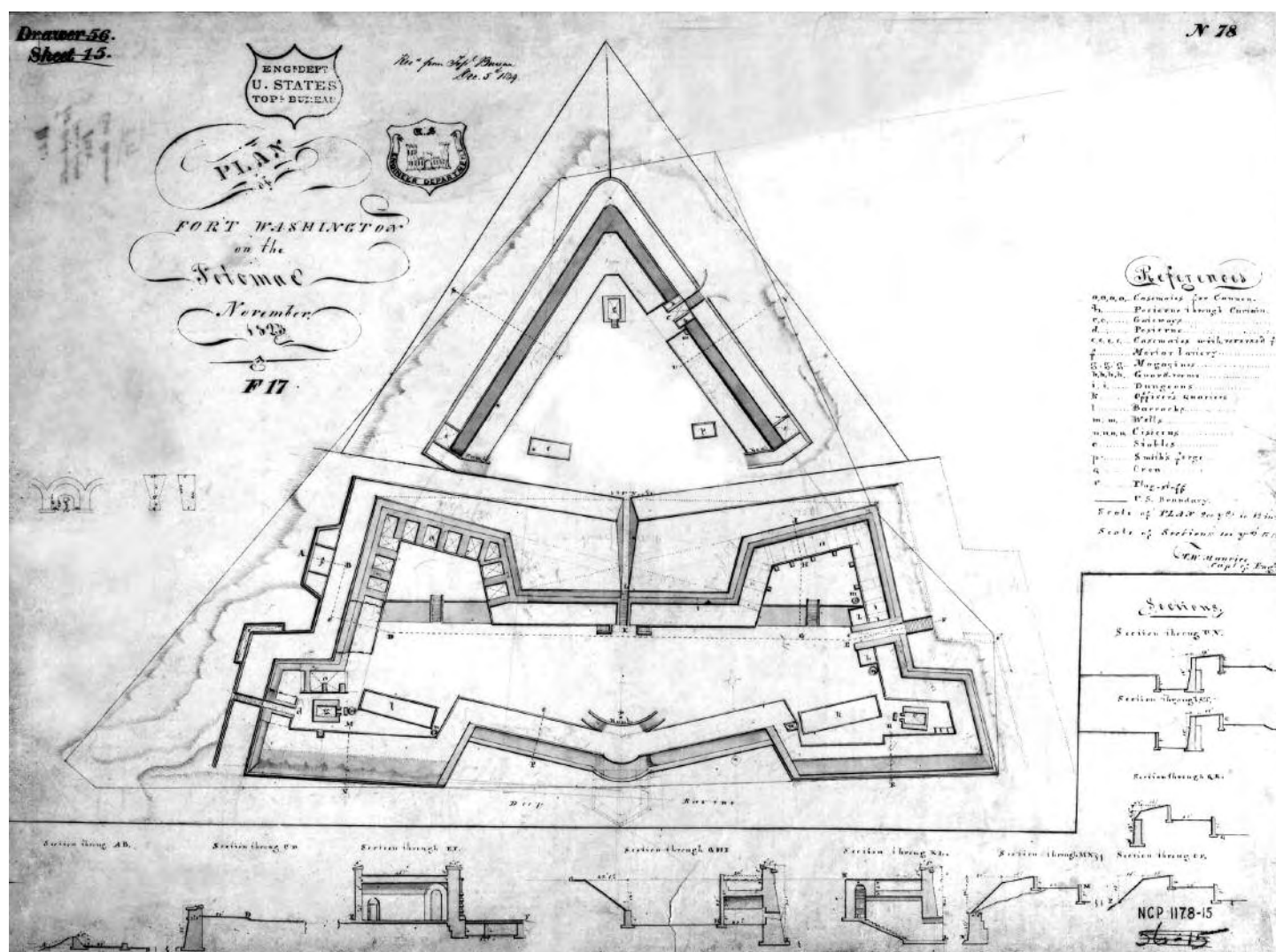
In 1802 newly-elected President Thomas Jefferson persuaded Congress to re-establish the Corps of Engineers and create a national military academy at West Point staffed by the engineers, thus forging a strong link between the Corps and the academy. Jefferson wished, as did George Washington, to establish a National University in the city of Washington, but decided that a military school would better serve the country’s needs by educating civil and military engineers. In Jefferson’s view, the Corps, running the nation’s first school of engineering, might have more than military duties, and he considered having its headquarters located in Washington. Poor in science but rich in resources, the United States might in the future look to its Army Engineers for internal improvements as well as defense. By 1816 approximately twenty-seven civilian civil engineers were active in the United States, and West Point’s small early graduating classes gradually produced military engineers whose civic works paralleled those of civil engineers working for states or for private canal companies. For example, Joseph G. Totten, who became Chief Engineer, was the academy’s tenth graduate, one of three in the class of 1805.

However, by 1837 Secretary of War John C. Calhoun noted that West Point had 940 graduates in total, most of them becoming artillery officers.⁵

The Congressional Act of March 16, 1802, that established the military's role during peacetime, stipulated: "The 27th section provided that the said Corps, when organized, shall be stationed at West Point...and shall constitute a Military Academy....and that the Engineers, assistant Engineers, and cadets, shall be subject to do duty at such places, and on such service, as the President of the United States may direct."⁶ Traditionally West Point's top students were commissioned into the Corps of Engineers and their tours of duty allowed them to confront problems in many parts of the country involving surveying, building fortifications, or laying out roads and canals.

Jefferson's choice of the first peacetime Chief of Engineers emphasized the unusual, even elite, nature of the Corps despite his determination to establish a meritocracy in the federal government's civil, judicial, and military branches. As American minister to France, Jefferson in 1785 met Jonathan Williams (1750–1815), grandnephew to Benjamin Franklin, whom Jefferson replaced in the Paris diplomatic post. Upon his return to America, Williams completed his education at Harvard College in 1787, and the following year became a member of the American Philosophical Society, eventually serving as its vice president. Williams's scientific talents were variously expressed in practical articles on thermometric navigation and the study of mathematics, botany, and medicine. In 1801 President John Adams commissioned Williams as a major in the Second Regiment of Artillerists and Engineers, and in the spring of 1802 he was appointed the first superintendent of the Military Academy. There Williams "occasionally read lectures on fortifications, gave practical lessons in the field, and taught the use of instruments generally," while colleagues taught mathematics.⁷ During his superintendence, Williams hired professors of drawing and French (most contemporary engineering treatises were written in French), skills that in conjunction with their engineering prowess gave the academy's students a combination of abilities that undoubtedly was unique in American education at this time.

Thus, from the outset, members of the Corps of Engineers were drawn from the best students at West Point who had been educated primarily in practical aspects of the arts and sciences. To provide his faculty and students with wider intellectual horizons, in 1803 Williams founded the U.S. Military Philosophical Society at West Point, whose motto was *Scientia in Bello Pax*, "Science in war guarantees [leads to; promotes] peace." Although the academy's early years were halting, increasingly larger numbers of students



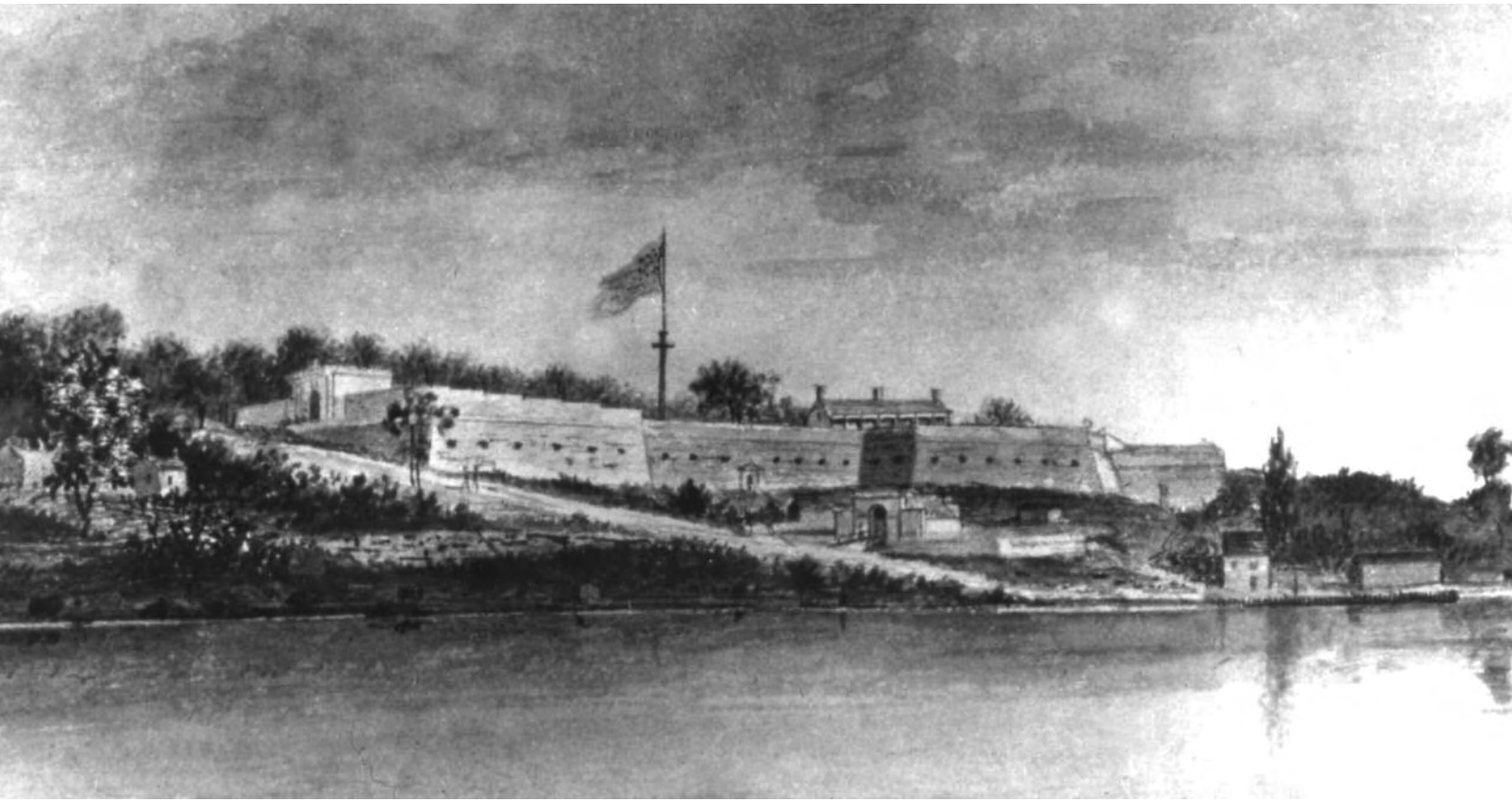
were among the country's few men formally educated in the practical sciences and they soon proved their worth. No post designed by a West Point graduate was captured by the British during the War of 1812. By the 1820s and 30s, "internal improvements" nationally either relied on surveying and mapping undertaken by the Topographical Engineers, or these public works were directed by members (and sometimes former members) of the various branches of the Corps. In 1812 L'Enfant was offered a professorship at West Point in the "Art of Engineering in all its Branches," but he declined.

Plan of Fort Washington, 1823. American troops blew up Fort Warburton, a weak and ill-positioned battery, in 1814 upon the approach of the British fleet. Afterwards L'Enfant was placed in charge of demolishing the old fort and beginning a new one. He was relieved by the War Department scarcely a year later.

National Archives no. 79-117.8-15

CORPS-DESIGNED FORTS PROTECT WASHINGTON

Both the Corps' military and civil expertise were used in and near the District of Columbia from an early date. On March 20, 1794, Congress authorized a series of forts to protect the harbors of American cities, the country's first permanent defensive system to be built. George Washington, concerned for his new capital, chose a bluff, Digges's Point, on the Maryland side of the Potomac, for the location of a future fortification. But it was not until 1807, when an incident in the Napoleonic Wars—a British attack on an



*Drawing of Fort Washington
(n.d.). Lieutenant Colonel
Walker K. Armistead and
Captain Theodore W.
Maurice designed and built
the new fort that was
completed in 1824.*

Office of History, Corps of Engineers

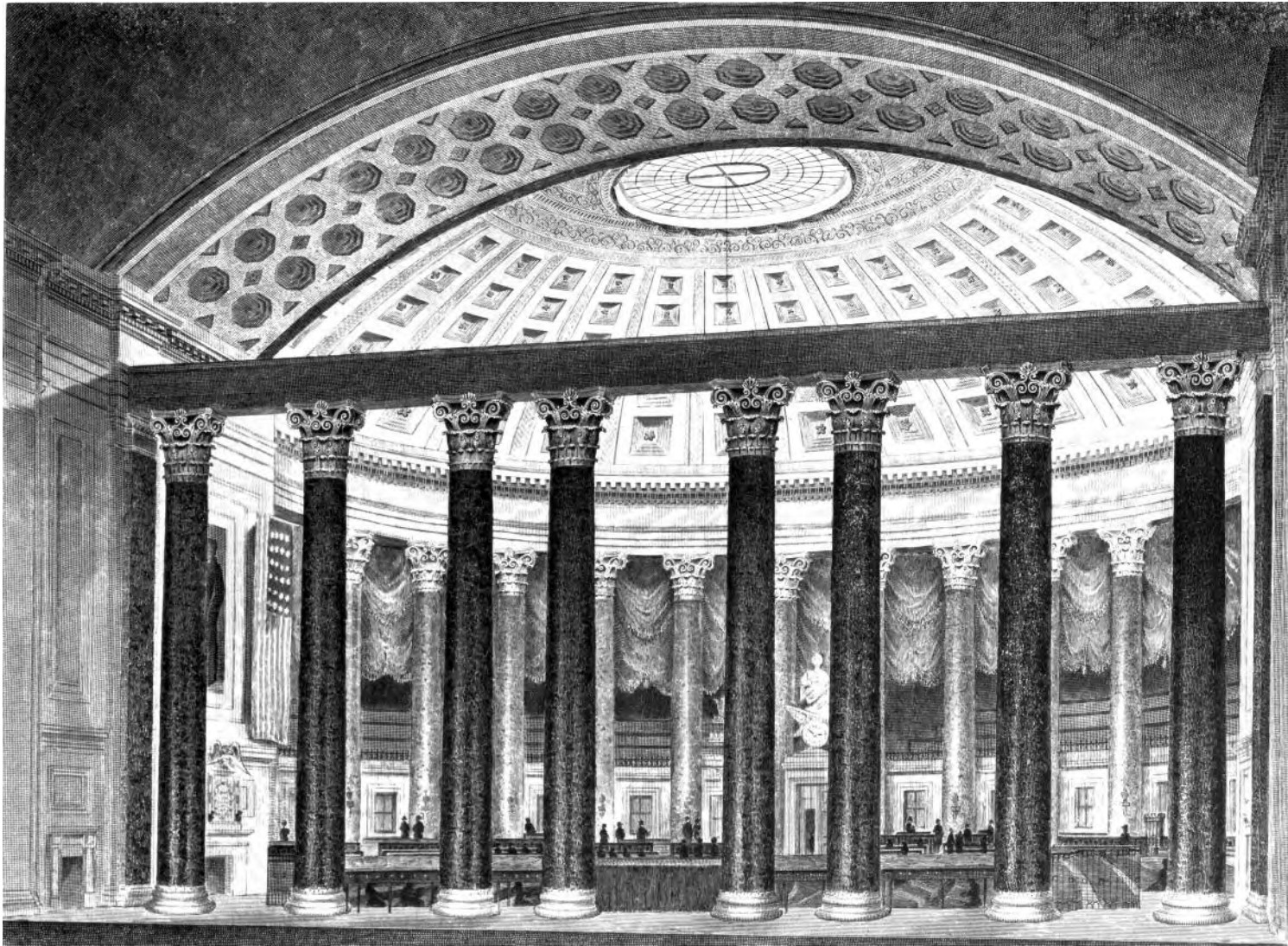
American frigate in coastal waters—prodded the government into action, and the government’s second system of fortifications was begun. On October 31, 1807, the Secretary of War ordered Chief Engineer Jonathan Williams to Washington to draw plans for defending American ports and harbors. Williams also was to examine the site at Digges’s Point, six miles downriver from Washington and within sight of Mount Vernon. Arriving in 1808, the Chief Engineer noted that Digges’s Point commanded the river but was overlooked by higher ridges. However, the government purchased land for the fort and ordered Captain George Bomford (c. 1780–1848), an 1805 graduate of the Military Academy who had been commissioned a lieutenant of engineers on graduation, to lay out a fortification at the site.⁸

By mid-summer, 1808, Bomford reported that Fort Warburton was “in a condition of forwardness,” and by the first of December 1809, it was “completed, to placing the merlons of sod on the parapet.”⁹ A water battery and little more, the work had semi-elliptical face and circular flanks, mounted thirteen guns, and enclosed quarters for two ordnance companies. “The parapet of this squat and sprawling fort was a solid ten feet, four inches thick and soared forty-one feet above the river.”¹⁰ Atop the bluff was an octagonal brick citadel—an ineffective defense against attack from the land, in the opinion of the Army’s senior general, James Wilkinson, who declared, “being calculated against musketry only, [it] could have been knocked flat by a twelve pounder.”¹¹

Colonel Decius Wadsworth, Army Chief of Ordnance, however, was of a different opinion when advising about strengthening the country's defenses after the War of 1812 was declared. On May 28, 1813, he wrote Secretary of War John Armstrong that Fort Warburton's "situation is so elevated, the result of a cannonade by ships from the river should not be dreaded," and he discounted an attack by land.¹² Wadsworth concluded his report advising against additional heavy guns at Fort Warburton or constructing a neighboring fort.

On August 24, 1814, a British force defeated the Americans at Bladensburg, Maryland, and pushed on to capture Washington and burn the public buildings. Meanwhile, a squadron of the British fleet worked slowly up the Potomac River, maneuvering through a maze of shoals and unknown currents against contrary winds. On the evening of August 27, the invaders bombarded Fort Warburton for two hours. Shortly after arriving to take command of the fort on August 6, and convinced that he would have to lead a rear-guard action, Captain Samuel T. Dyson told Lieutenant James Edwards, who had formerly been in command of the fort's small garrison, to "plan the trail of gunpowder in case they had to demolish the fort themselves." Seeing the smoke rising from Washington where the Capitol had been fired on the evening of August 24, and the other public buildings the following day; receiving reports from civilian visitors to the fort on the 25th and 26th about the enemy's advance; and sighting the British fleet sailing up the Potomac River on the 27th, Dyson ordered the fort's cannons spiked and its evacuation that evening. (During the day President James Madison returned to Washington where he appointed James Monroe the new Secretary of War.) Dyson led his retreating forces only fifty paces before the first shell fired from the English warships landed near them; they had walked about three miles before the powder magazine containing 3,346 pounds of powder blew up from their own charges while mortars and rockets launched by the British were landing on and near the fort. At his court martial, which began on November 1, Dyson asked, "Was I not justified in concluding that the overwhelming force of the enemy had driven back all opposition and that my miserable post and little band was all that survived the general wreck?" The following day, Sunday, August 28, the British occupied the fort and the now defenseless city of Alexandria surrendered; Dyson was court martialed and barred from future military service.

Major Peter Charles L'Enfant was called as a witness in Dyson's defense at his court martial, but it is not certain he testified. He had played some part in defending the city. From March until July 1815, L'Enfant oversaw the reconstruction of the wharf at Fort Warburton



*Alexander J. Davis's ca. 1832
watercolor of the House of
Representatives as completed
with a wood dome*
Avery Architectural and Fine Arts
Library, Columbia University

and the building of a ravelin at the water's edge. Early in 1816 the Topographical Engineers, Colonel Walker K. Armistead and Captain Theodore Maurice, began a new fort, now renamed Fort Washington, on the higher bluff above the earlier work.¹³

CORPS ENGINEERS CONSULT ON CAPITOL CONSTRUCTION

On March 17, 1817, President James Monroe consulted with Army Engineers about rebuilding the Capitol that had been gutted by explosions and fire on August 24, 1814. After architect Benjamin Henry Latrobe made proposals for its reconstruction, Monroe sought the expertise of Brevet Brigadier General Joseph G. Swift (1783–1865), one of the first two graduates of West Point in 1802, and a decade later Chief Engineer, and Colonel George Bomford, since 1815 the chief of the Ordnance Department. Latrobe proposed vaulting with brick the rebuilt House and Senate chambers (which originally had been vaulted). Monroe was concerned about the weight of the vaults compromising the safety of the Capitol (its foundations had been damaged in the fire), but also stressed that “this

building should be finished with the greatest possible expedition.” Although Swift and Bomford agreed that Latrobe’s structural engineering of the vaults was sound, they reluctantly agreed to wood vaults, citing time, reduced cost, and public fears about masonry vaulted rooms. Latrobe responded to the engineers on March 31, arguing that wood domes above a stone colonnade and entablature were inadvisable because they would be susceptible to dry rot, “expand and contract with the weather,” be subject to fire, and “would require more time to erect, plaster, and paint than to turn a brick dome.” Monroe and the engineers prevailed and wood domes were built over both chambers, however, in 1901 they were replaced with cast plaster supported by steel trusses.¹⁴

Swift and Bomford, who had known Latrobe through their joint membership in the U.S. Military Philosophical Society, were asked by Monroe to mediate a quarrel between Latrobe and George Blagden, the superintendent of the Capitol’s stonecutters. Latrobe wished to use a small deposit of a variegated breccia stone found in a Virginia quarry near the Potomac River for the colonnades in the legislative chambers, but Blagden believed the stone to be inferior in quality. Monroe accompanied Swift, Bomford, and Latrobe to inspect the quarry and decided that the government should take over the quarry’s operation. This collaboration of Swift, Bomford, and Latrobe affected the range of American materials that Latrobe then used in rebuilding the Capitol as he could now call upon experienced construction engineers to help him select the best limestone and marble. In 1817 Swift traveled to New York to oversee preparation of the marble entablatures for the Senate chamber, taking Latrobe’s drawings with him.¹⁵

ISAAC ROBERDEAU AND THE CORPS’ TOPOGRAPHICAL BUREAU

In October 1817 President James Madison appointed South Carolinian John C. Calhoun as Secretary of War. A gifted administrator with his eyes on the White House, Calhoun was determined to create a better Army. Among other reforms, he ordered Chief Engineer Swift to Washington, declaring, “he should be stationed at the seat of Government, to superintend, under its immediate control, the great and important duties assigned to the corps.” November found Swift packing for the move from Brooklyn, and on April 1, 1818, he was in his new “office in Washington City.” Swift, however, did not remain in Washington long; he resigned from the Army in October when Calhoun appointed the French-born engineer Simon Bernard his equal in rank (but his subordinate within the Corps).¹⁶



Major Isaac Roberdeau
Courtesy of Historical Society
of Pennsylvania

Born in Philadelphia in 1763, Isaac Roberdeau studied engineering in London and returned to the United States in 1787 to write about, survey, and study astronomy. In 1816 he was commissioned a major, his time divided between West Point and Washington until 1818 when the Topographical Engineers' headquarters were permanently located in Washington and Roberdeau became its chief. During the early 1820s, Roberdeau accompanied Calhoun on intermittent inspection tours, but most of his time was spent caring for the Topographical Corps' maps, plans, and mathematical instruments. Before his death in 1829, Roberdeau collected public and private surveys of all parts of the country, his composite maps redrawn from them used by many government offices as well as private individuals during the decade the American frontier began to expand dramatically. This was only one part of the War Department's "collections

in geology, paleontology and ethnology, including the remarkable series of paintings of Indians and Indian scenes." Roberdeau's two decades spent surveying and superintending the construction of canals (1792 until 1813), combined with his military experience, gave him the expertise to author the unpublished "Mathematics and Treatise on Canals," written about 1828, a decade before the first published work by an American on canals. John Quincy Adams, a fellow savant, spent "many hours discussing astronomy and other sciences" with him. Roberdeau's duties as the curator of the War Department's collection of maps, surveys, and instruments were seemingly not strenuous for someone of his education and capabilities. When Congress questioned his light responsibilities, Roberdeau was defended by both the Chief of Engineers and the Secretary of War, rather than transferred, which suggests that his unofficial duties may have included moving in diplomatic circles, perhaps even gathering information gleaned during his notably active social life.¹⁷

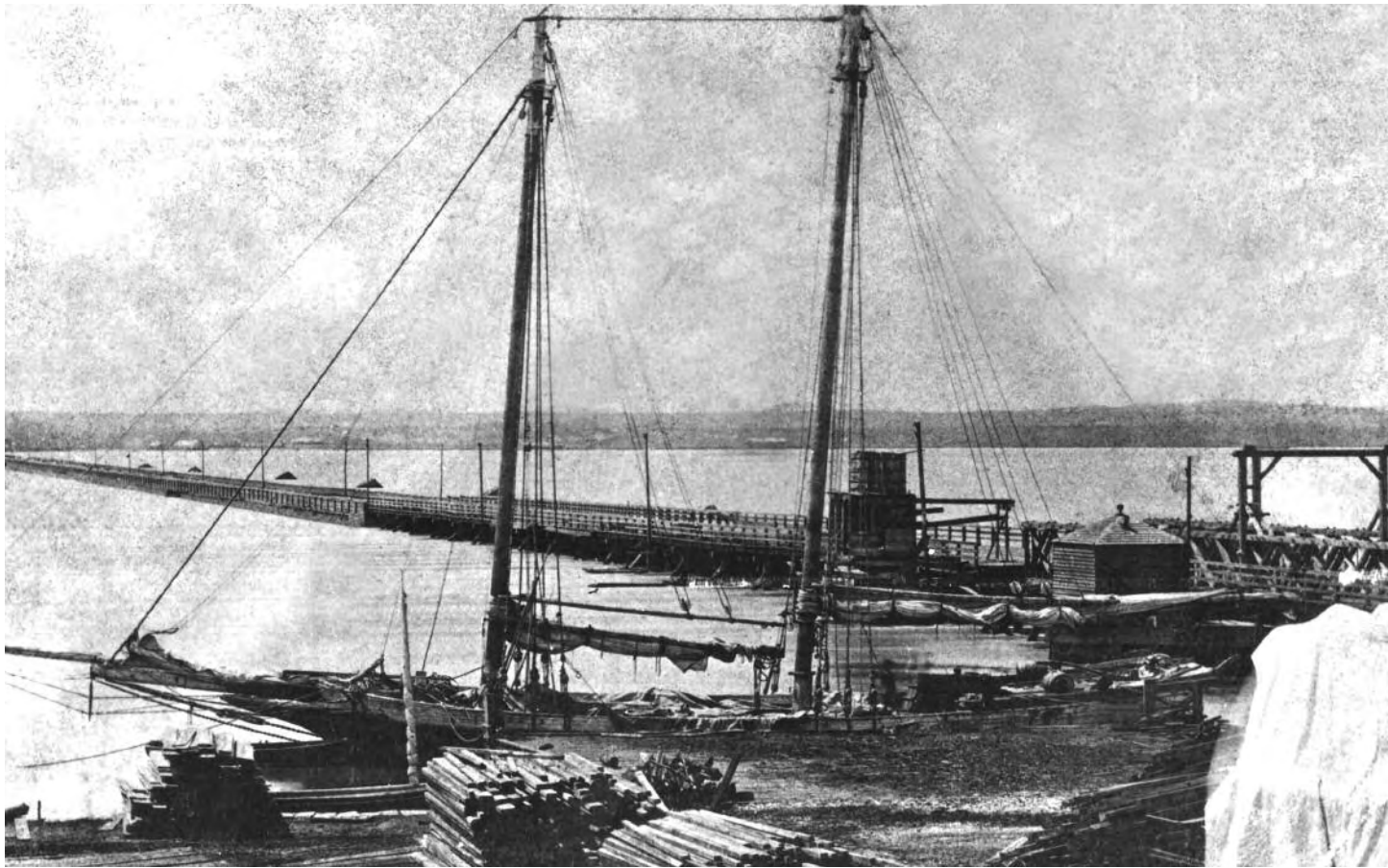
"Among the residents of our town," the Metropolitan and Georgetown Commercial Gazette reported on October 19, 1824, "we noticed at the Mayor's [reception for the Marquis de Lafayette] the Secretary of War, the Post Master General, the gallant Generals McComb [sic] and Jessup, and Col. Roberdeau of the Corps of Engineers." After visiting Georgetown College, Lafayette "repaired to the Secretary of War's residence. He was handed down from his carriage by Colonels Cox [Georgetown's mayor] and Roberdeau." Between October 12, 1824, when the Marquis de Lafayette first arrived in Washington, and September 9, 1825, when the frigate Brandywine passed Cape Henry light returning him home to France, Roberdeau was a frequent guest at several of the official functions honoring the Revolutionary War general during his farewell trip to America. President John Quincy Adams led the dignitaries at Roberdeau's funeral on January 17, 1829; he and Adams had been fast friends as well as fellow amateur astronomers, with Roberdeau's daughters frequent guests at the White House where they often assisted at banquets.¹⁸

In 1813 Congress created the Topographical Engineers to carry out surveys of seacoasts, rivers, and the country's interior to support the work of the Corps, which was engaged in building fortifications. The Topographical Engineers were abolished on June 15, 1815, but revived the following year. In 1816 Isaac Roberdeau was commissioned a Major, his time divided between West Point and Washington until 1818 when the Topographical Engineers' headquarters were permanently located in Washington and Roberdeau became chief of the newly established Topographical Bureau. During the early 1820s, Roberdeau accompanied Calhoun on intermittent inspection tours, but most of his time was spent caring for the Topographical Bureau's maps, plans, and mathematical instruments. Before his death in 1829, Roberdeau had collected public and private surveys of all parts of the country, his composite maps redrawn from them used by many government offices as well as private individuals during the decade the American frontier began to expand dramatically. This was only one part of the War Department's "collections in geology, paleontology and ethnology, including the remarkable series of paintings of Indians and Indian scenes."

THE CORPS' INCREASING RESPONSIBILITIES

The Corps of Engineers and its Topographical Bureau played an intermittent role in government construction and public works in the District of Columbia before 1853. As Congress gradually took a bolder line in local spending, engineer officers contributed to individual projects as their expertise was required. In 1822, for example, when Congress appropriated funds for the installation of cast-iron pipes to carry water from the government-owned spring in Franklin Park to the executive buildings in the President's Park, Roberdeau supervised the work. In 1830 a civil engineer employed by the Topographical Bureau made a pioneer study of Washington springs, and two years later Congress voted \$45,700 to improve water service for the government by purchasing Smith Spring north of the city and piping its water to the Capitol.¹⁹

In 1831 a freshet swept away part of the wooden superstructure of the Long Bridge, which crossed the Potomac from the foot of 14th Street in Washington to Arlington, Virginia. Authorized in 1808, and built by a chartered company, for decades this toll bridge connected Washington to Virginia. Although temporary repairs were made, Congress purchased the bridge in 1832 to improve the connection to the south and provide public access without a toll. The president selected topographical engineer Lieutenant Colonel James Kearney to survey the condition of the existing bridge and propose a plan for its

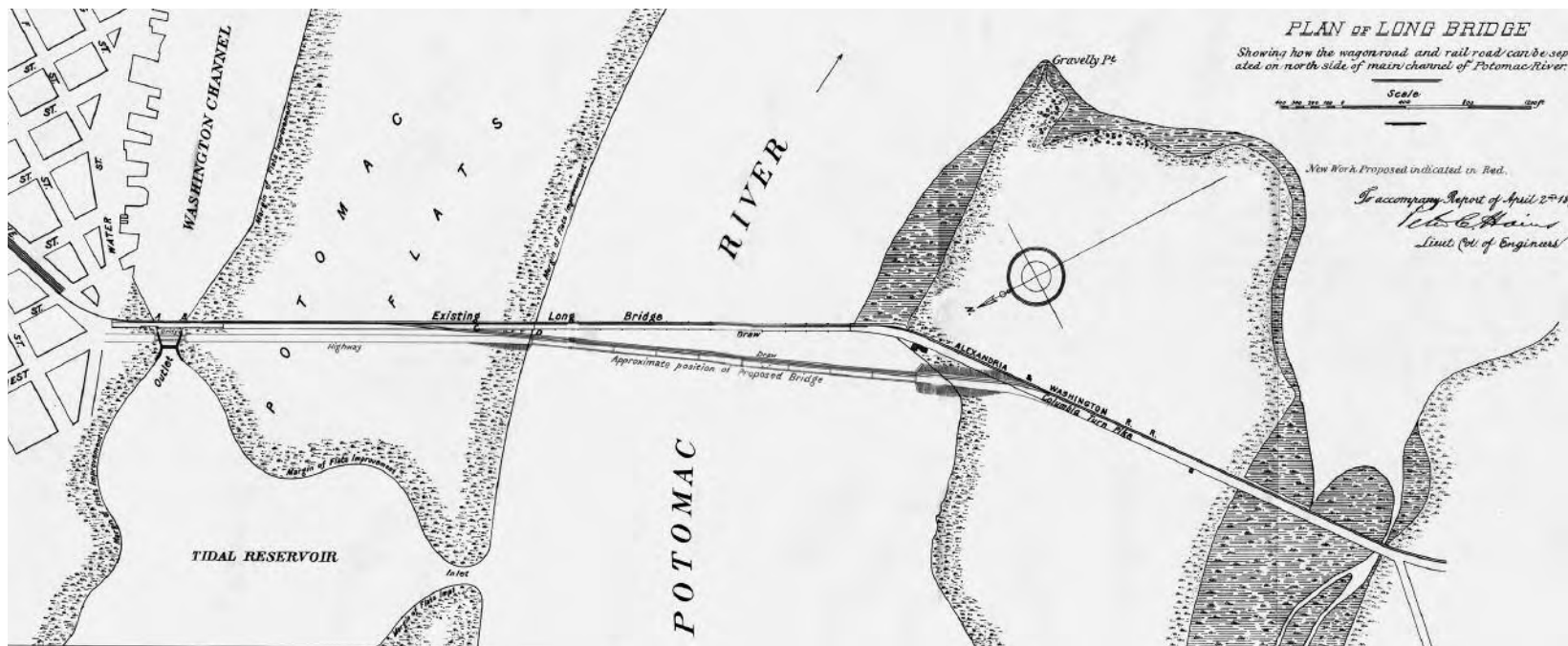


Long Bridge across the Potomac River, 1860, taken from its landfall at 14th Street and Maryland Avenue, SW
Office of History, Corps of Engineers

reconstruction.²⁰ When Congress authorized funding for the actual rebuilding, however, it delegated the work to the Secretary of the Treasury, who chose the West Point-educated civil engineer George W. Hughes to superintend the work.²¹

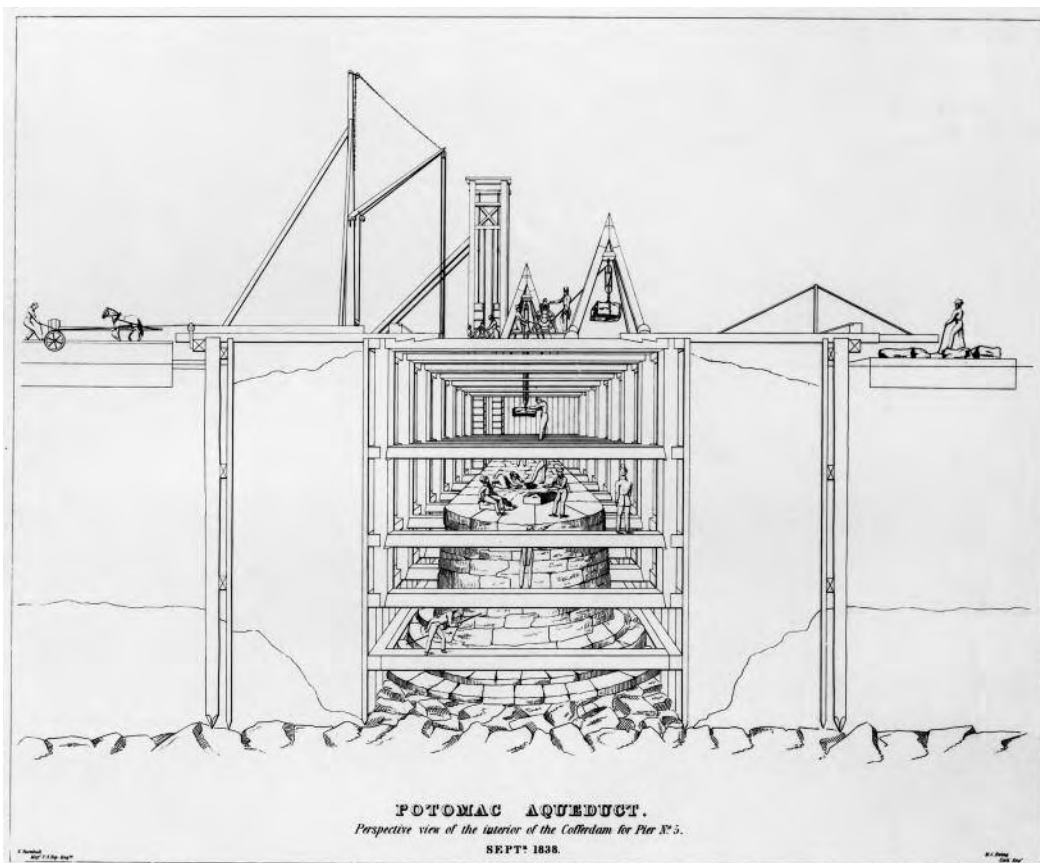
Congress also took an interest in the Aqueduct Bridge in Georgetown, which provided another link to the Virginia shore. Congress had invested \$1 million in the Chesapeake and Ohio Canal when, in 1831, the Alexandria Canal Company began to construct a branch south of the Potomac. Congressional appropriations backed this new venture, and when an aqueduct—essentially a wooden trough and causeway on massive stone piers—was needed to carry the canal across the river, “the company considered it advisable...to have its expenditure placed under the direction of an officer of the corps of topographical engineers.” This would provide direct federal oversight of federal monies, and, “in so difficult and rather unprecedented an undertaking, allow the company to avail themselves of the presumed science of [the Topographical] officers.”²²

Topographical Captain William Turnbull (1800–1857) was assigned the aqueduct work. He initially worked in close collaboration with the engineer of the Canal Company, surveying the riverbed, designing the structure, and devising the means of its construction. After building cofferdams to hold out the river, Turnbull laid the foundations of the



piers nearly forty feet deep to reach bedrock covered by twenty feet of mud, noting that the sight “of men busily at work so far below the surface of the river, seemed to interest the public exceedingly; but to the engineer, whatever might be his confidence in the ability of the dam to resist the immense weight which he knew to be constantly pressing upon it in the most insidious form, the sight was one which filled him with anxiety, and

Plan of Long Bridge, showing the existing span and a modification proposed in 1890
 Office of History, Corps of Engineers,
 ARCE 1890



Perspective view of the interior of the cofferdam for the construction of pier 5 of the Aqueduct Bridge, 1838
 Office of History, Corps of Engineers



Aqueduct Bridge from the east bank of the Potomac River above Georgetown, 1860s, with the Georgetown Canal on the left
National Archives no. 77-HCS-1B26

urged him to the most unceasing watchfulness.” Turnbull was assisted by Lieutenant M. C. Ewing, an artillery officer, and briefly by another officer from the infantry. At the end of 1835, as one of the project’s many dams went up, Turnbull lamented, “it could not have been altogether completed and tested this season; but a force of mechanics sufficient for the purpose could not be obtained. Another extensive work in the vicinity being in progress at the same time, the demand for labor was very great.” Begun in 1833 and completed in 1843, the bridge remained in private hands when completed, with the United States as a shareholder in the company.²³

Barge using the Aqueduct Bridge across the Potomac River (n.d.)
Office of History, Corps of Engineers

As Federal construction work grew, Army Engineers increasingly supplied the skills that made its accomplishment possible. A young lieutenant, Andrew A. Humphreys,



superintended construction of a bridge over Rock Creek, and spent the summer of 1843 determining the grades of Washington streets. By 1838 citizens were complaining about the dust on the rapidly wearing Pennsylvania Avenue, and, at Senate request, head of the now independent Topographical Bureau, Colonel John James Abert (1788–1863), suggested repairs in his report on the paving of Pennsylvania Avenue west of the White House. George W. Hughes and Topographical Bureau Captain Campbell Graham repaired Pennsylvania Avenue, directed the paving of 15th and 17th Streets, and constructed the 15th Street sewer. The two worked with architect Robert Mills on unrealized designs for the new War Department building during the early 1840s.²⁴

During the 1820s Mills had been the architect for the South Carolina Board of Public Works, which undertook civic projects on the state level similar to the Corps' national projects. Throughout this period, Mills sought employment with the Corps of Engineers. He first wrote Secretary of War (and fellow South Carolinian) John C. Calhoun on October 4, 1824, sending him his map and treatise on cutting a canal between the Susquehanna and Potomac Rivers. Nearly two years later, on September 12, 1826, Mills again wrote Calhoun asking to be appointed to the Board of Engineers for Internal Improvements and reapplied in May 1827. On November 8, 1827, Mills wrote Brigadier General Macomb concerning how the Corps of Engineers might use his *A Manuel on Railroads*. Brigadier General Charles Gratiot responded to Mills's August 15, 1829, letter of application sent directly to President Andrew Jackson; Gratiot again informed Mills that there were no openings for civilian engineers. Mills continued to correspond with Gratiot during the 1830s concerning water supply systems and brick manufacturing.²⁵

In 1838 Mills's persistence resulted in Secretary of War (and fellow South Carolinian) Joel R. Poinsett appointing him to design the new barracks at the Military Academy at West Point and its Library and Philosophical Apparatus (scientific laboratories), which was slightly altered when constructed by Army Engineer Richard Delafield. This contributed to the growing competition between the Corps of Engineers and private architects who worked for the government, an antagonism present until the end of the nineteenth century and often inflammatory and counterproductive.

In 1831 the Topographical Bureau was separated from the Corps of Engineers, and throughout the next two decades the activities of the parent branch were largely confined to military construction. Although the Corps was not actively involved in building the city, its headquarters was staffed by some of the country's best-educated men drawn principally



Colonel John James Abert
Courtesy of Historical Society of Pennsylvania



Bvt. Maj. Gen. Joseph G. Totten
by Robert W. Weir

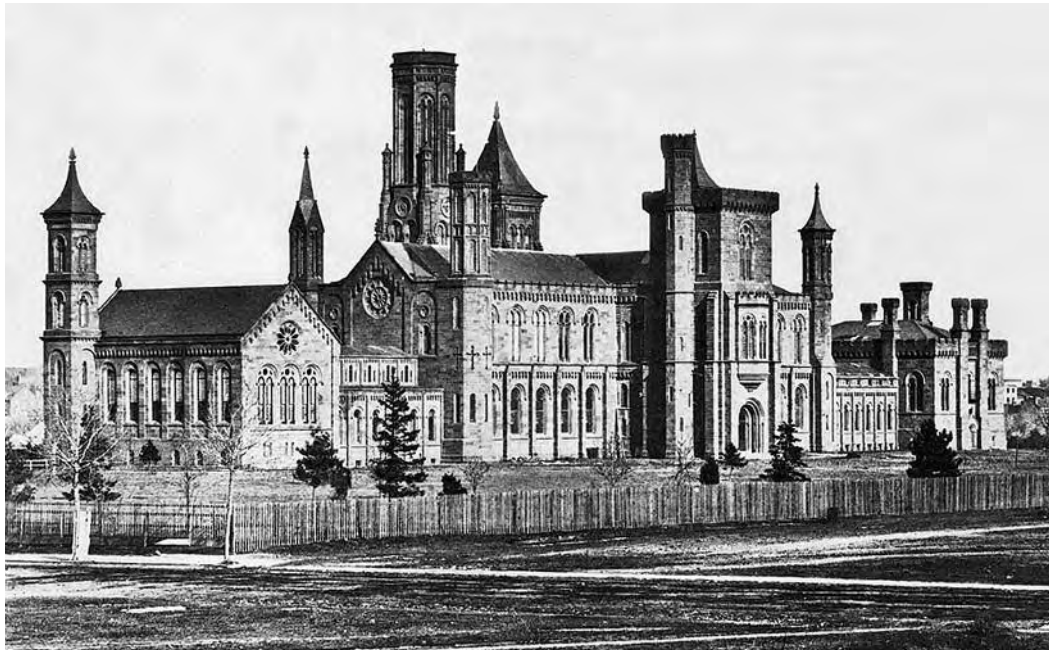
*West Point Museum Art Collection, United
States Military Academy, #7511*

from prominent families who easily fit into the federal city's intellectual and political circles. A key figure in the Corps' growing prestige and in its later role in public buildings was Colonel Joseph G. Totten (1788–1864), appointed Chief of Engineers in December 1838.²⁶

CORPS ENGINEERS AND THE SMITHSONIAN INSTITUTION

Genial and courteous, a skilled soldier, and a scientist whose interests ranged from sea shells to ballistics, Totten found full scope for his talents in the nation's capital. A friend of powerful men, in 1840 he joined John Quincy Adams, Secretary of War Poinsett, and Chief Topographical Engineer Lieutenant Colonel John J. Abert to found the National Institute for the Promotion of Science. The group, which included many Army and Navy officers stationed in Washington, held monthly meetings where members occasionally delivered papers of general scientific interest. More frequently, they viewed and discussed books, drawings, and objects (historical as well as scientific) sent by sister organizations or collected by their own members. One of the chief reasons for founding the National Institute was to be the intellectual society in place able to accept the bequest of English scientist James Smithson "to found at Washington...an establishment for the increase and diffusion of knowledge among men." The 1846 law establishing the Smithsonian Institution stipulated that two members of its board of regents be members of the National Institute. Totten, and scientist and former Army Engineer Alexander Dallas Bache, superintendent of the U.S. Coast Survey, both were chosen and served with six members of Congress, the vice president, chief justice, secretary of state, the mayor of Washington, and a few private citizens who were known educators, a total of fifteen eminent professionals who each contributed their expertise.²⁷

At the first meeting of the regents in September 1846, Representative Robert Dale Owen of Indiana, Totten, and Washington Mayor William W. Seaton (also the publisher of the *National Intelligencer*) were named to the executive committee. They, along with the Smithsonian's chancellor, Vice President George M. Dallas, and temporary Secretary of the Smithsonian, Representative William Jervis Hough, constituted the new institution's building committee. "The committee was to determine the best methods of warming, lighting, and ventilation, the best material for the exterior of the building, and the best site." Beginning on September 14, 1846, some building committee members interviewed architects in Philadelphia, New York, and Boston, visiting some of their buildings. Totten was unable to join the team until they arrived in Boston where they



*Smithsonian Institution, ca. 1852,
with some of the evergreens and
deciduous trees planted under the
direction of A. J. Downing*

*Smithsonian Institution Archives, Record
Unit 95, Box 30, Folder 7, image #36881*

consulted with architects Isaiah Rogers and Ammi B. Young, both mature builder-architects who successfully completed federal works.²⁸

Although Totten initially supported Francis Markoe (a clerk in the State Department and a founding member of the National Institute) to be the Smithsonian’s permanent secretary, he became one of Joseph Henry’s most influential allies after the Princeton scientist was chosen to lead the institution in December 1846.

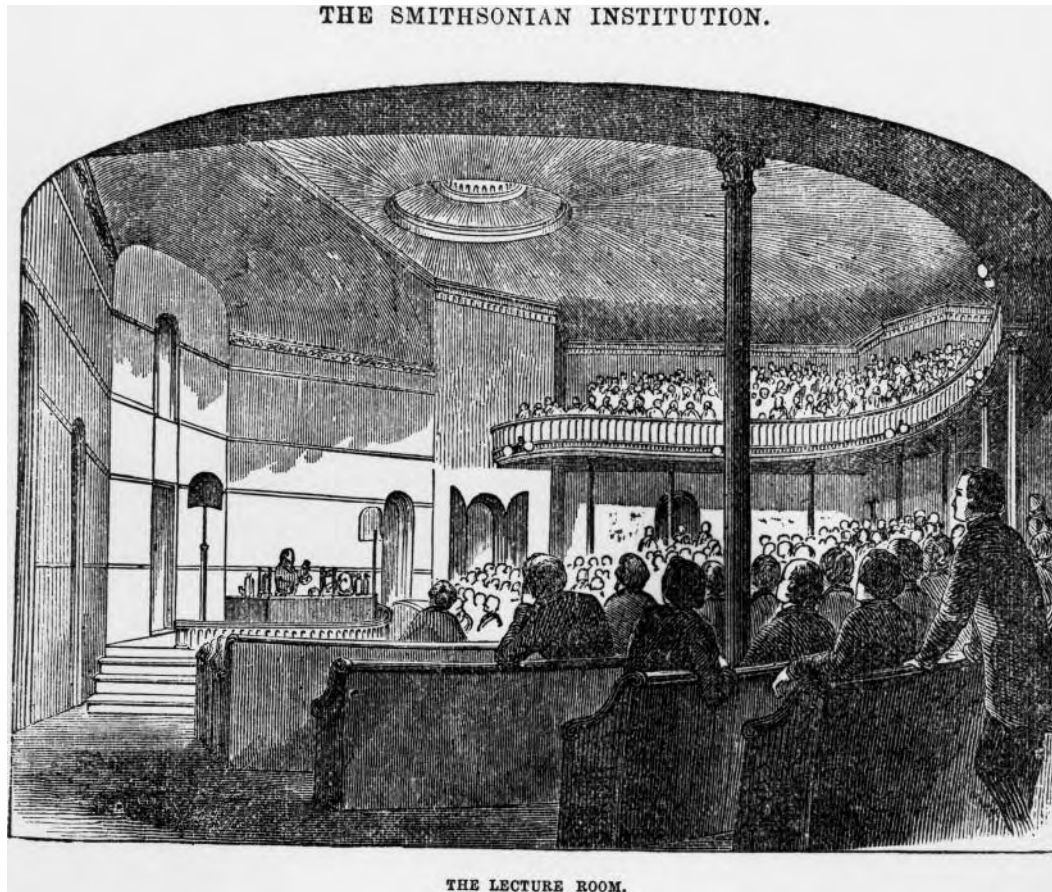
About Totten, Henry confided to his wife: “Bache told me that when we became acquainted with each other we would draw together. Now that he is on the ground many things will go on well with reference to the building.” In December 1847 Totten asked to be excused from the building committee because consulting on contracts and checking the quality of workmanship on the building was becoming too time consuming. Eighteen months later, the Smithsonian’s youthful architect, James Renwick, was required to submit to Totten several alternative plans for the arrangement of rooms in the east wing (which contained laboratories and the chemical lecture hall) when the original configuration was found to be unworkable. It fell to Totten to choose the best scheme and he continued to support Henry when the secretary proposed other internal changes.²⁹

In the spring of 1850 Totten was one of six regents appointed to a special committee “to determine the extent of any contractual violations and to estimate the cost of repairing the damage” after part of the floor in the Smithsonian’s main hall collapsed. This



Smithsonian interior

*Smithsonian Institution Archives, Record
Unit 95, Box 41, Folder 7, image #16847*



Smithsonian Institution lecture hall, designed by Captain Barton S. Alexander, who, between 1853 and 1855, redesigned many interiors to be fireproof

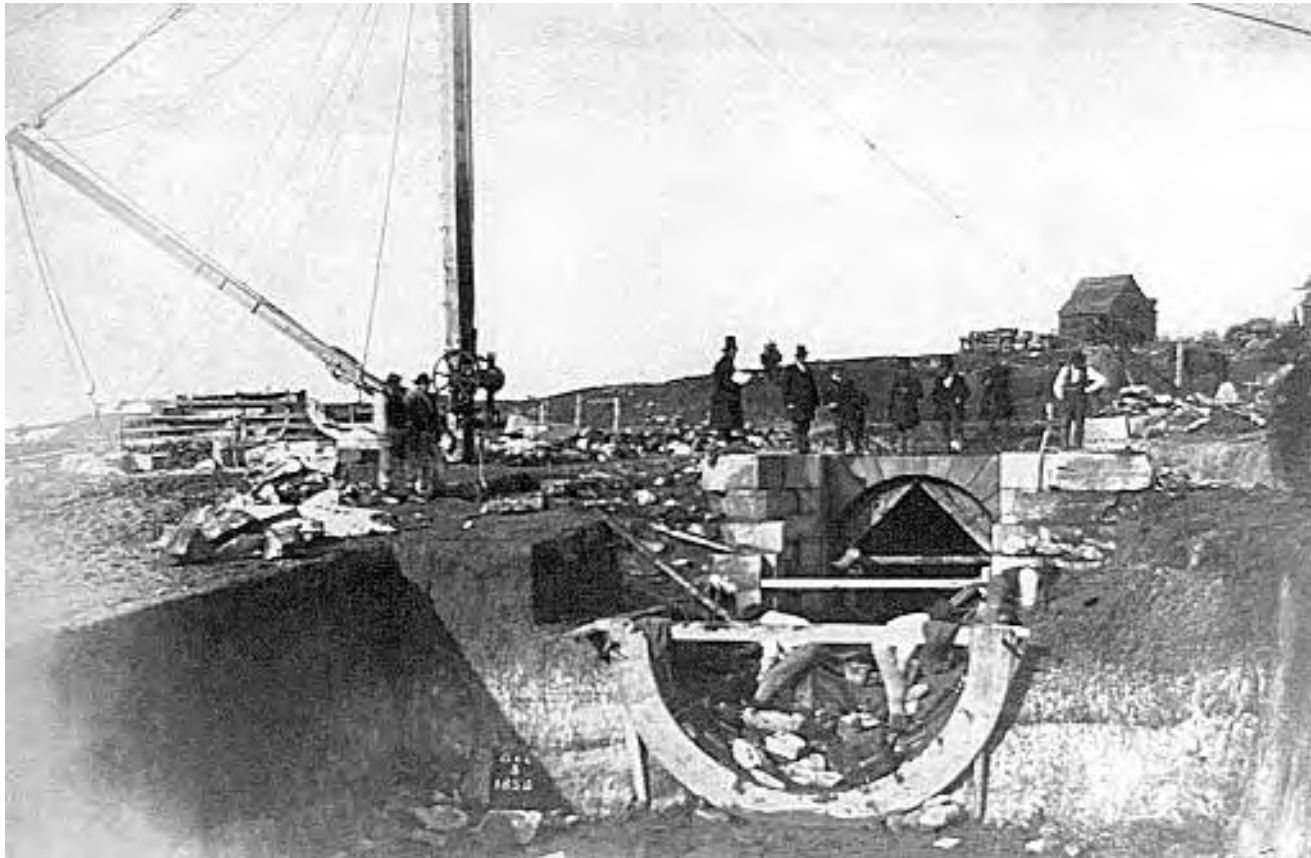
Smithsonian Institution Archives, Record Unit 95, Box 31, Folder 40, image #43804K

Immediately, Captain Barton S. Alexander (1819–1878) of the Corps of Engineers prepared drawings for fireproofing the unfinished central block. Two years later Alexander was detailed to design the first building for the Soldiers' Home and supervise its construction.³⁰

Between 1853 and 1855 Alexander worked closely with Henry to redesign and construct rooms in the Smithsonian's main block and to rebuild some parts of the east wing, adding a second story to serve as the secretary's residence. Alexander's function at the Smithsonian differed from Totten's; he was the superintendent of construction, consulting with Henry and the building committee and suggesting changes to Renwick's design. His most important contribution was the spartan, two-story lecture room that dominated the top two floors of the central section of the main block. Henry considered Alexander as "rather too extravagant, having been used to the purse of the government." Alexander considered his room to have dignity and simplicity: "There is not much ornament, but still enough, I think, to enable the building to do its duty with grace and dignity."³¹

Fireproof, masonry-encased iron beams installed by Alexander in 1853–54 did their job on January 24, 1865, when a fire broke out on the roof above the lecture room.

committee called in three impartial experts: Colonel William Turnbull of the Corps of Topographical Engineers and two architects who were currently constructing government buildings elsewhere, South Carolinian Edward B. White and Baltimorean John R. Niernsee. In August Totten played a key role that allowed Renwick (who had several important Washington connections) to submit final bills indicating the Smithsonian was completed.



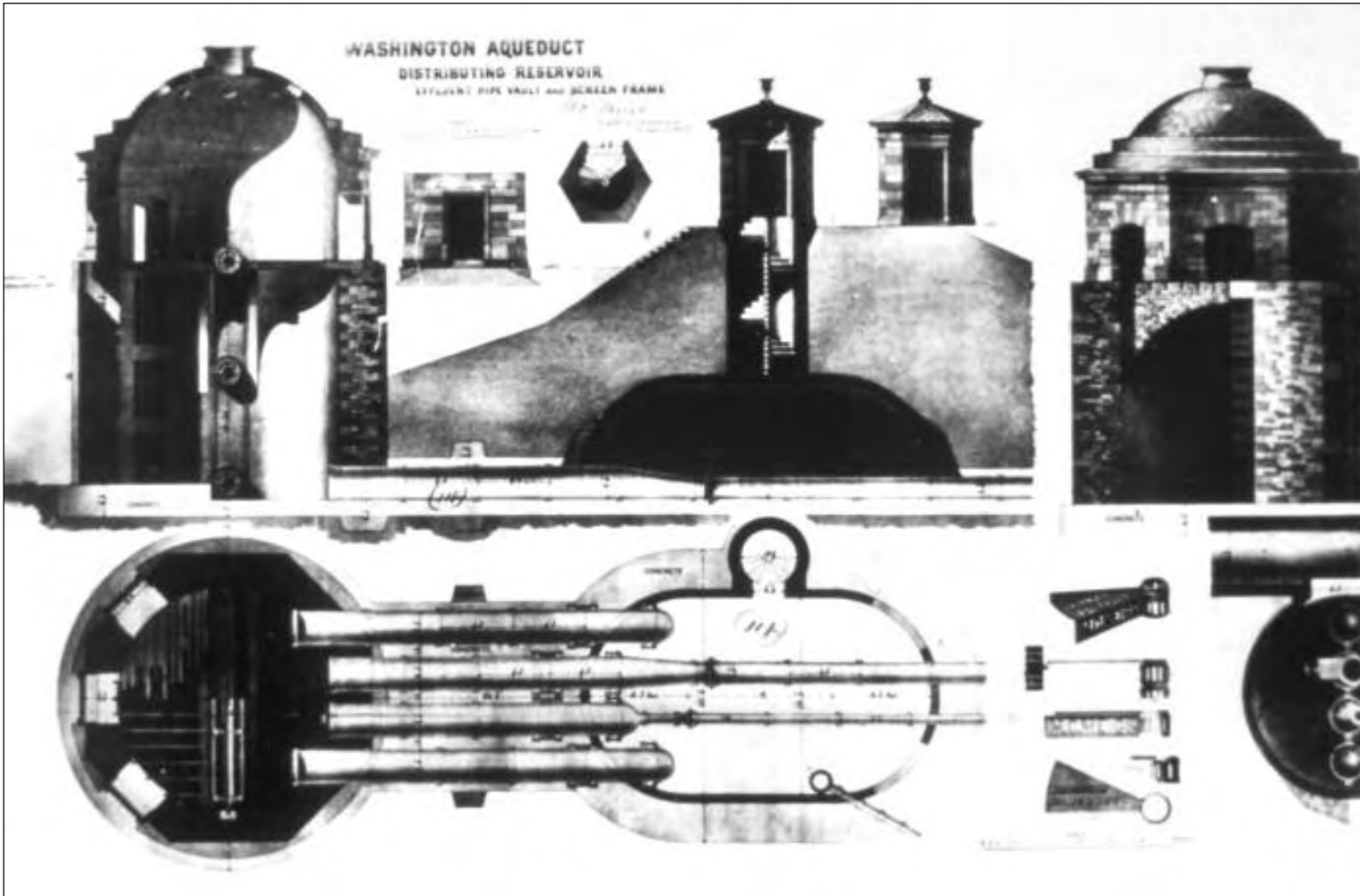
The roof collapsed and the second floor was gutted, but Alexander's beams prevented the total destruction of the building. Henry immediately applied to Secretary of War Edwin M. Stanton asking for the Army's help in raising a temporary roof. Alexander surveyed the damage, discovered the cause of the fire, and estimated that thirty to forty carpenters could erect a temporary roof in two days, work that was completed under the Army's supervision by January 31. German émigré architect Adolf Cluss was given the job of rebuilding and once again the Smithsonian's interiors were changed to adapt to the institution's changing nature with the lecture hall eliminated. The role of the Corps reverted once again to a supervisory one; General Richard Delafield served as the chairman of the Smithsonian's building committee during Cluss's rebuilding campaign.³²

*Influent gatehouse,
Georgetown Reservoir,
1858, built on the site of
the present Georgetown
Library*

*Library of Congress, Prints
and Photographs Division,
LC-USZ62-88575*

SUPPLYING WASHINGTON WITH WATER

The Corps' more traditional role as hydraulic engineers occupied a number of men who designed and built Washington's water system during the 1850s. President Millard Fillmore declared in his first annual message to Congress in 1851 that "nothing could contribute more to the health, comfort and safety of the city and the security of the public buildings and records than an abundant supply of pure water." A few months before, in

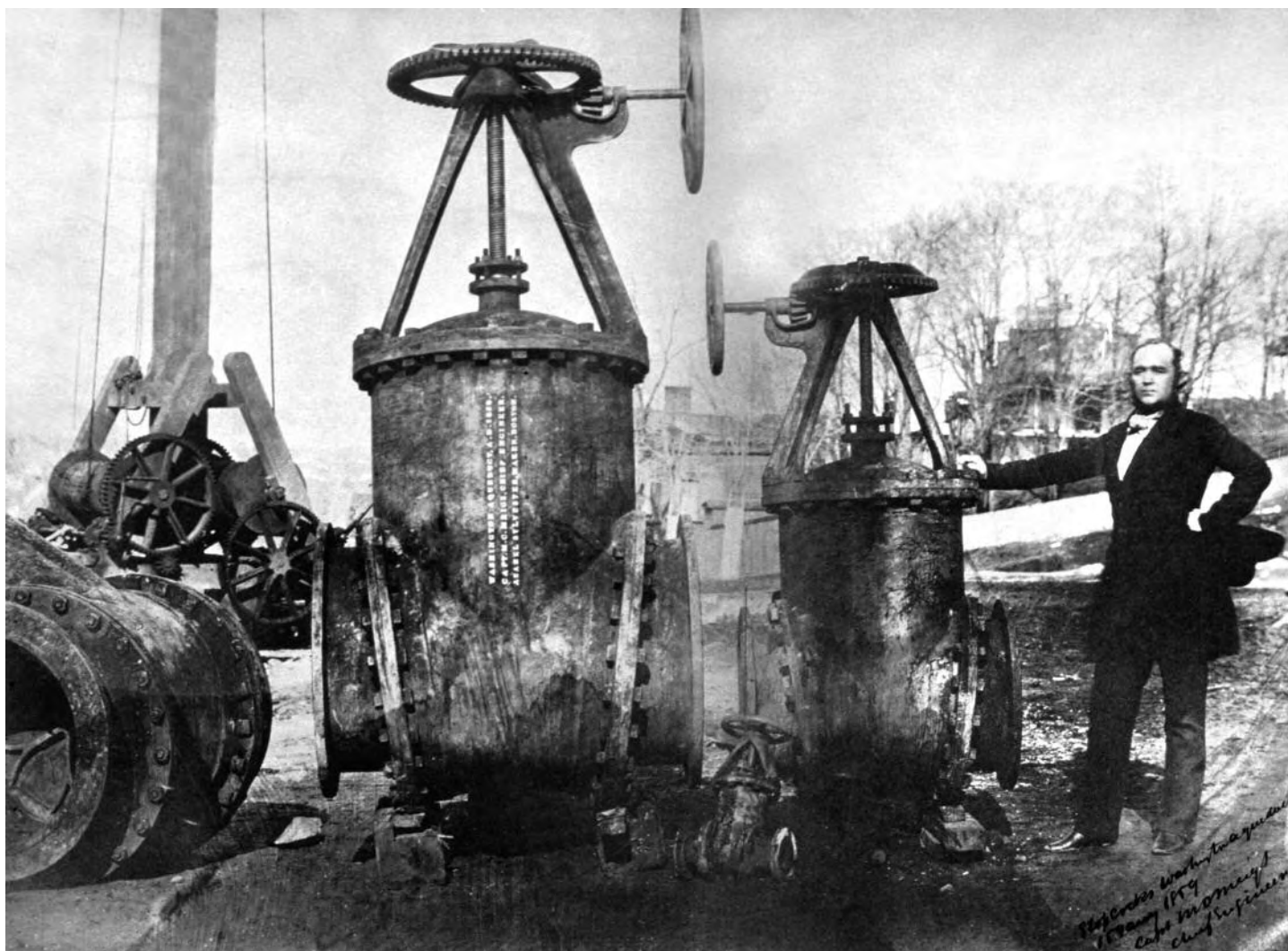


*Drawing of Aqueduct
equipment, 1857
Office of History, Corps
of Engineers*

the fall of 1850, Congress confronted the long-standing problem of the city's water supply by voting \$500 for a War Department survey to locate the best sources. The survey was undertaken by Captain George W. Hughes of the Topographical Corps, who, due to the limited amount appropriated, confined his report to the use of Rock Creek as a supply.³³

In December 1851 a fire broke out in the Capitol, destroying the Library of Congress and threatening the wooden dome. The following summer Congress voted \$5,000 for "surveys and estimates of the best means for affording the cities of Washington and Georgetown an unfailing and abundant supply of good and wholesome water." This bill was prepared by Fillmore's Secretary of the Interior, assisted by local banker William W. Corcoran and by Chief of Engineers Colonel Totten. Fillmore assigned the survey to the Corps. Totten turned the job over to Captain Frederick A. Smith, his long-time deputy, but Smith died one month later. Casting about for a successor, in October 1852, Totten picked a young lieutenant, Montgomery C. Meigs.³⁴

*"Thus quietly and unostentatiously
was commenced the great work. Which
is destined I trust for the next thousand
years to pour healthful water into the
Capital of our union. May I live to
complete it & connect my name
imperishably with a work greater in
its beneficial results than all the
military glory of the Mexican War."*



For three months, Meigs, assisted by civil engineer William H. Bryan, surveyed the countryside northwest of Washington and worked on his report. After careful study, he proposed that the city draw its water supply either from Rock Creek or from the Potomac River at either Little Falls or Great Falls. Using Great Falls would entail the greatest engineering effort and cost the most money, but it would produce the largest and most reliable supply. Meigs preferred an aqueduct capable of serving a growing city for centuries to come. “Let our aqueduct be worthy of the Nation,” he wrote. “Let us show that the rulers chosen by the people are not less careful of the safety, health, and beauty of their Capital than emperors [of Rome].”³⁵

When Congress asked the president to choose among the three alternatives Meigs suggested, newly inaugurated Franklin Pierce chose the Great Falls plan. On March 29, 1853, Jefferson Davis, secretary of war and strongman of the new cabinet, selected Meigs—scion of a prominent Democratic family—to head the project. A demonstration of his individualistic style followed. Meigs refused to give bond, telling Davis, “The security of

*Captain Montgomery C. Meigs
with Aqueduct equipment, 1859
Office of History, Corps of Engineers*



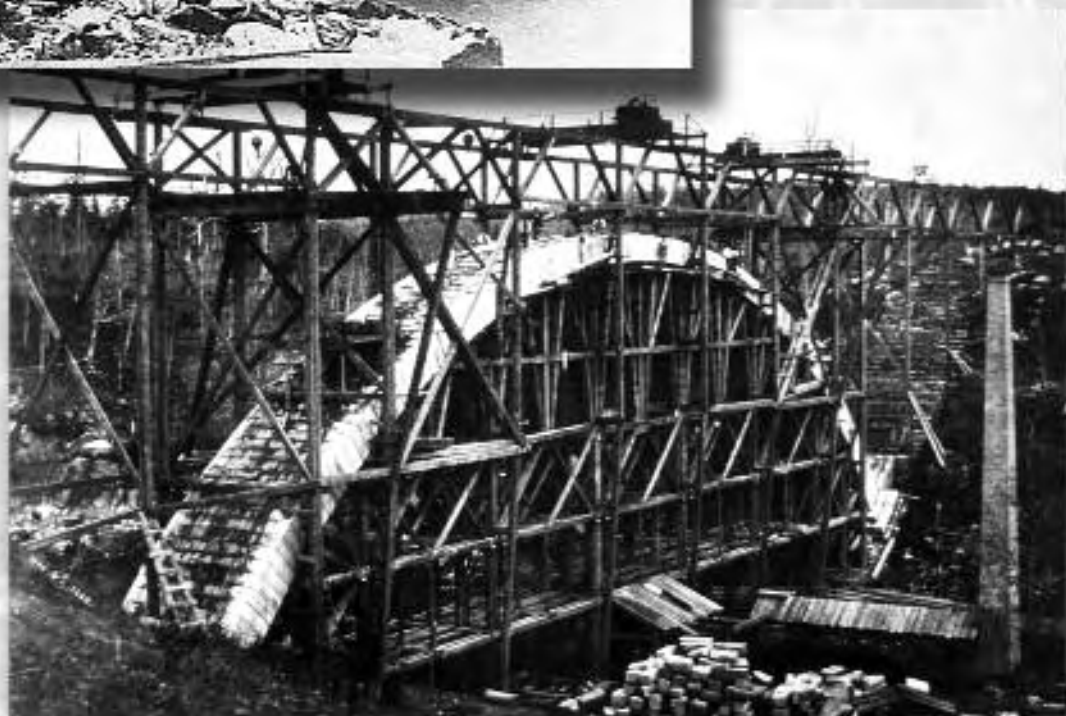
1858

**CONSTRUCTION OF
CABIN JOHN BRIDGE**

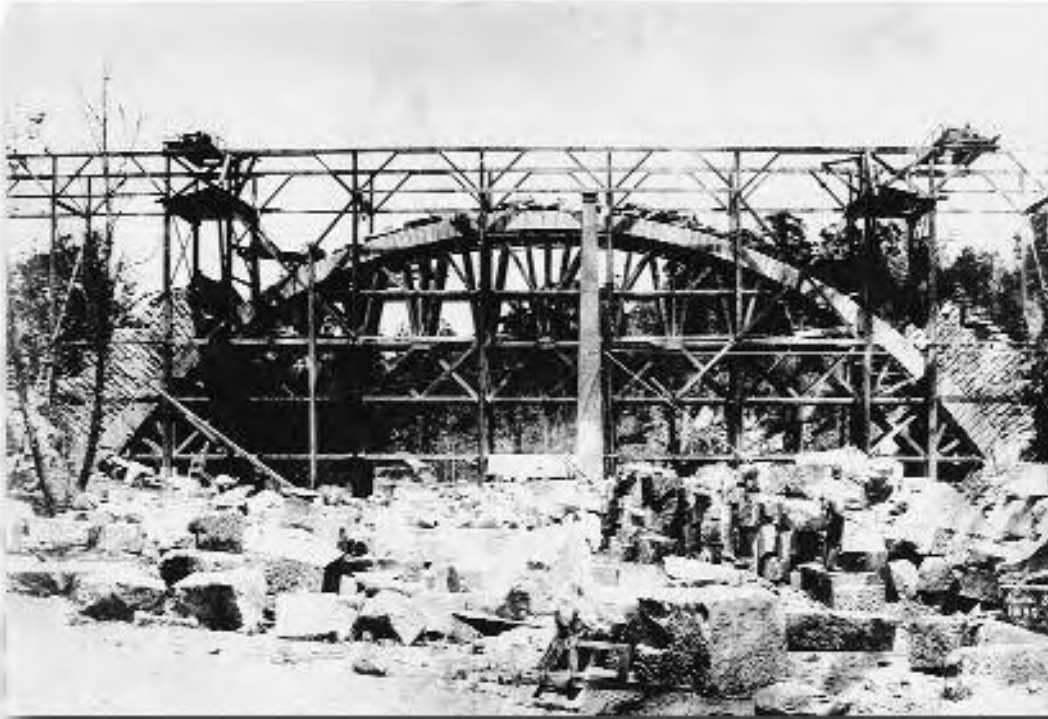
The Corps built the bridge using the Roman arch construction technique of a central keystone holding wedge-shaped stones (voussoirs) in position.



May 1858



December 1858



June 1859



August 1861



Civil War Era



*Digging tunnels for the
Aqueduct, August 1858*
National Archives no. 77-HCS-1B4

an Engineer officer's commission and character [is] better than the bond of a civil agent.” A new force had arrived on the Washington scene.³⁶

Over the decade that followed, Meigs directed the building of a dependable water supply system marked by touches of striking originality. The main conduit was a circular masonry tunnel nine feet in diameter and ten miles long. It ran from the Potomac to a fifty-acre receiving reservoir near the district line, created by damming the Little Falls Branch, which provided sedimentation and storage. Two miles further along, a thirty-six-acre distributing reservoir on the Potomac Palisades served for additional storage, before two cast-iron mains, one thirty inches and the other twelve inches in diameter, carried the water into the city. A third storage reservoir was a domed rotunda building fifty feet high on the heights of Georgetown at the corner of Wisconsin Avenue and R Street. Additional pipes carried the Aqueduct's water to the Capitol and then as far as the Navy Yard, the total length of the system being 18.6 miles.³⁷

Underground work was craftsman-like and durable; that aboveground was graceful and bold. Meigs built classical temples to hide the machinery and serve as gatehouses. At Cabin



John Run, he adopted a design prepared by his gifted assistant, Alfred L. Rives, and spanned the deep ravine with the longest ashlar masonry arch in the world. He carried the Aqueduct across Rock Creek by an ingenious bridge in which two forty-eight-inch cast-iron tubes served both as supporting arches and water mains. The structure carried both the city's water supply and the traffic of Pennsylvania Avenue. Throughout its length, the Aqueduct bore the marks of an original engineering mind.³⁸

It also bore Meigs's name, for vanity was no small foible of his. He recorded in his diary for October 31, 1853, the turning of the first spade of soil at Great Falls. "Thus quietly and unostentatiously was commenced the great work. Which is destined I trust for the next thousand years to pour healthful water into the Capital of our union. May I live to complete it & connect my name imperishably with a work greater in its beneficial results than all the military glory of the Mexican War." Although the workforce of seven hundred free and slave laborers received no memorial, Meigs did order the names of his assistants—Alfred Rives, W. H. Bryant, C. Crozel, C. G. Talcott, and W. R. Hutton—engraved on stone tablets, though Rives's name, like that of Secretary Davis, was later erased when he joined the Confederacy.

Pennsylvania Avenue Bridge over Rock Creek supported by forty-eight-inch cast-iron water mains with Georgetown in the background. In 1876 the Engineer Officer in Charge of Public Buildings and Grounds decided that the bridge was no longer capable of carrying heavy loads, provoking outrage from Montgomery Meigs. The Chief of Engineers appointed a board of engineer officers to examine the bridge, which was declared sound and remained in service until 1916.

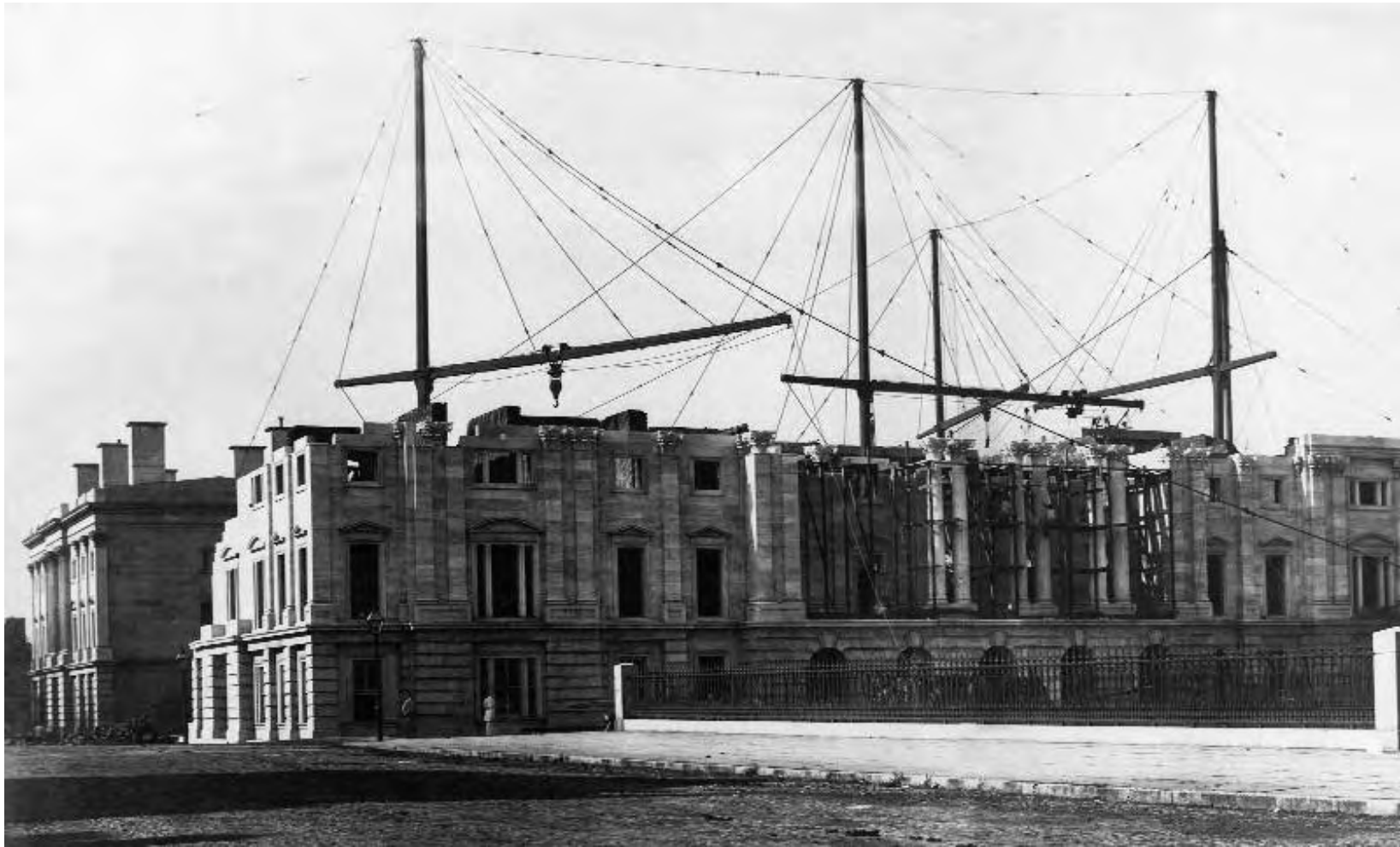
Office of History, Corps of Engineers

But Meigs saw the Aqueduct largely as a memorial to himself. Throughout the Aqueduct's length, he had his name engraved on and cast into bridges, gatehouses, pipes, staircases in pipe vaults, even on the derricks and hoisting gear. No one then or later would forget that the project was his.³⁹

In 1852 Captain Alexander H. Bowman (1803–1865), an 1825 graduate of West Point, was chosen to head up the new Bureau of Construction in the Treasury Department and promoted to major. His previous experience constructing defenses on the Gulf of Mexico and Charleston (he built Fort Sumter), while at the same time working on rivers and harbors, prepared him to manage several large-scale projects simultaneously. In his 1853 annual report to Congress on the state of finances, Secretary of the Treasury James Guthrie appended a list of thirty-eight “Regulations for the construction of custom-houses and other buildings.” The regulations were probably written largely by Bowman to summarize his experience with divided administration and working with local contractors in areas distant from Washington but answerable to the War Department. The regulations laid out in some detail the responsibilities of everyone along the chain of command on what procedures to follow if an officer in charge suspected poor quality construction in a fail-safe bureaucratic system of checks and balances in order to avert fraud both in the field and in Washington.⁴⁰

This emphasis on accountability led to Bowman being detailed to the Treasury Department. Until 1860 he worked with architect Ammi B. Young erecting approximately seventy federal buildings throughout the country during the government's second great building campaign. In 1855 President Franklin Pierce chose Bowman and Young to undertake their largest project, to carry out Thomas U. Walter's design for the Treasury Extension. Walter and Meigs hoped to secure the job in addition to their other work, principally superintendence of the Capitol Extension. Three years earlier Walter and Meigs had replaced Robert Mills as the architect and engineer of the Patent Office Extension and a few weeks before Pierce's decision on the Treasury Building, Walter's design for the General Post Office Extension was chosen with Meigs put in charge of its construction.⁴¹

The Aqueduct was the Corps' major project in Washington before the Civil War, but not its only one. In 1857 the mayor of Georgetown, concerned about the navigability of the Potomac, asked the secretary of war to assign an Army Engineer to superintend a survey of the river's Georgetown Channel. Secretary John Floyd delegated Captain Isaac C. Woodruff, an assistant in the Corps of Topographical Engineers, to the task.



Woodruff's January 1858 report was the first thorough description of the river's conditions in the district since 1792. It noted both the Potomac's central role in supporting local commerce and in moving materials for the Aqueduct and the Treasury Building extension. Woodruff quoted a letter from Bowman, citing "great delays and inconveniences [that] have arisen from the detention of vessels loaded with granite, by grounding on the bars, with serious loss to the contractor, in detention and lighterage on granite intended for [the Treasury] building." The city undertook dredging the channel and private entrepreneurs built a new dock in Foggy Bottom to unload materials for the Aqueduct and the Treasury Extension.⁴²

U.S. General Post Office Extension under construction, August 1858. Captain Meigs was in charge of constructing the extension to the General Post Office, 1855–60, at the same time Captain Bowman was in charge of building the Treasury Building's south wing extension.

Library of Congress, Prints and Photographs Division, LC-USZ62-38920

U.S. CAPITOL EXTENSION

Two American titans in their respective professions clashed over control of Washington's major mid-nineteenth century building projects, the extension of the U.S. Capitol and the design and construction of its new cast-iron dome. For nine years Captain Montgomery C. Meigs of the Corps of Engineers and Philadelphia architect Thomas U. Walter divided the

responsibilities for these monumental tasks, initially working in concert, but eventually in competition with one another professionally and personally.

The Capitol's extension began before the formal competition of 1850–51 that resulted in Walter being named architect of the Capitol Extension. On March 3, 1843, Congress requested the Secretary of War to direct the Corps to prepare a design “for the better accommodation of the sittings of the House of Representatives,” a room with serious acoustical faults that defied the efforts of three architects, Charles Bulfinch, William Strickland, and Robert Mills, and the Corps engineers who worked with them during the 1820s and 30s.⁴³



THE WASHINGTON MONUMENT GROUNDS WERE NOT ALWAYS MONUMENTAL. THE GROUNDS WERE FENCED IN DURING THE CIVIL WAR AND CATTLE WERE RAISED THERE TO FEED UNION TROOPS STATIONED IN WASHINGTON. THE SOUTH WING OF THE TREASURY BUILDING, ON THE RIGHT, WAS COMPLETED UNDER THE DIRECTION OF CAPTAIN BOWMAN SHORTLY BEFORE THIS PHOTOGRAPH OF 14TH STREET WAS TAKEN IN THE 1860S. THE BOARD OF PUBLIC WORKS IN THE 1870S FILLED IN THE CANAL NORTH OF THE CATTLE. TODAY, THE FILLED CANAL IS CONSTITUTION AVENUE.



During the spring and summer of 1843 Topographical Corps engineer A. A. Humphreys (1810–83), working under Colonel Abert, determined that lateral additions to the existing Capitol would solve the need for increased space for congressional business, offer the opportunity to construct new legislative chambers upon better acoustical principles, and improve what the Corps and others considered the aesthetic fault of the disproportionate height of Charles Bulfinch's dome, completed in 1824. Humphreys and Abert reported that a new House wing, 103 feet by 152 feet placed symmetrically at right angles directly against the Capitol's south wall, could be constructed without disrupting the normal work of Congress. The engineers consulted the writings of acoustical experts and concluded that the new House of Commons in London would be the appropriate model. Corps engineers designed a rectangular room 75 feet by 105 feet within the wing to have a flat ceiling and level floor overlooked by public galleries on two sides. The Corps made detailed estimates that also included modern methods of heating and ventilating such a large room.

After determining the form, position, and scale of the wing additions (the new Senate Wing would be built following that for the House), Abert asked Strickland to suggest an alternate interior arrangement for the House wing, and to calculate its cost to compare to the government's estimates for the Topographical Corps' design. Strickland designed a rectilinear, galleried House, its flat, cast-iron ceiling admitting light through four cupolas with its lateral galleries able to accommodate six hundred spectators. Estimates for both the Humphreys-Abert and Strickland schemes were just under \$300,000 per wing, a sum apparently too great at this time because Abert wrote the architect on April 5, 1844, that the entire idea had been abandoned. However, the early formula

*Corps of Topographical
Engineers' 1845 drawing of the
extension of the Capitol, with
porticoed lateral wings attached
directly to the original building*
Architect of the Capitol, 63447

*Capitol with its low dome,
1851. South, or House wing,
extension, in relationship
to Charles Bulfinch's
dome built in 1823*

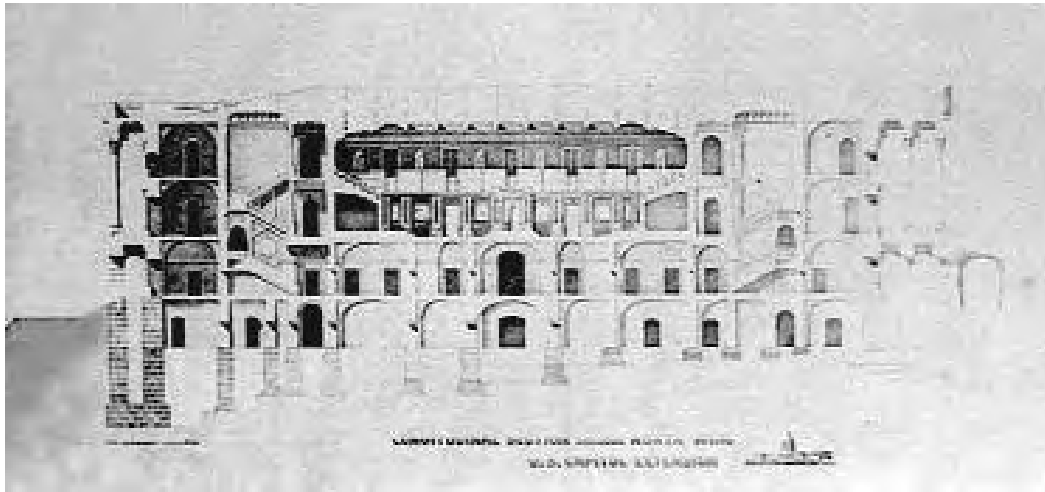
*Library of Congress, Prints and
Photographs Division, LC-USZ62-62168*



for how to extend the Capitol and design new legislative chambers on better acoustical principles, first suggested by the Corps, was further developed during the 1850s by Walter and Meigs.

Six years later Congress decided to go ahead with the project to extend the Capitol. On July 4, 1851, the cornerstone for the extension was set, and Walter, hired by the Department of the Interior, contracted for a year's work on foundations. Immediately he encountered difficulties prompted primarily by aesthetic issues—republican simplicity versus the Victorian splendor and opulence of his winning design. The government's financial situation also changed dramatically when the mineral rights gleaned from the Gold Rush began filling the federal treasury.⁴⁴

Walter's first skirmish was over the Massachusetts marble chosen for the wings. The Secretary of the Interior appointed General Totten, Smithsonian secretary Joseph Henry, the commissioner of the Patent Office, and Walter to a commission to test various marbles. The result of their December 22, 1851, report was the decision to use marble from Massachusetts, Maryland, and New York. The second difficulty Walter encountered concerned the foundations of the wings; on April 2, 1852, engineers Frederick A. Smith and J. L. Mason reported that the gneiss and hydraulic cement



Longitudinal section through the north wing of the Capitol extension. Meigs moved the chambers to the center of each wing from their perimeters as Walter had planned.

Library of Congress, Prints and Photographs Division, LC-USZ62-88915

being used were excellent, the Corps having been called in as consultants by the Senate's Committee on Public Buildings.

On December 24, 1851, fire destroyed Bulfinch's Library of Congress, which spanned the west wing's top two stories. Between March 1852 and July 1853, Walter replaced it by inserting a three-story cast-iron cage of shelves and balconies manufactured by the Janes, Beebe & Company of New York. Although the new Library of Congress officially had America's first cast-iron ceiling suspended from an iron truss roof, all of the rooms' other iron elements were the logical conclusion of Walter's earlier Philadelphia works using iron construction. Walter's innovative use of cast-iron in the library soon became the basis for Walter's and Meigs's design and construction of the Capitol's wings as well as additions they made to the Patent Office (1853–67) and General Post Office (1855–69).⁴⁵

When the administration changed in 1853, Democrat Franklin Pierce quickly transferred oversight (on March 23) of the Capitol's construction from the Interior Department to the War Department at the request of Secretary of War Jefferson Davis. Allegations against Walter concerning his contracts for materials were investigated and explained but the government was leery of any appearances of malfeasance. On April 4, 1853, Davis chose Captain Meigs to carry out Pierce's executive order calling for the Corps' general supervision and control of the whole work. In April 1854 the propriety of having military engineers supervise civil works in general, and public buildings in particular, was debated by two Washington newspapers. The *Daily Union*, reporting on Kentucky Congressman Richard H. Stanton's charge that about seventy Army officers were currently unlawfully involved in civil projects, noted that the engineers were carrying out their legitimate duties "in compliance with the laws of Congress and the orders of their government."



Thomas U. Walter's eastern elevation of the north wing of the Capitol extension, 1855. Meigs decided to place pediments above each portico and supervised Thomas Crawford's sculpture in the Senate wing pediment.

Architect of the Capitol, 59142

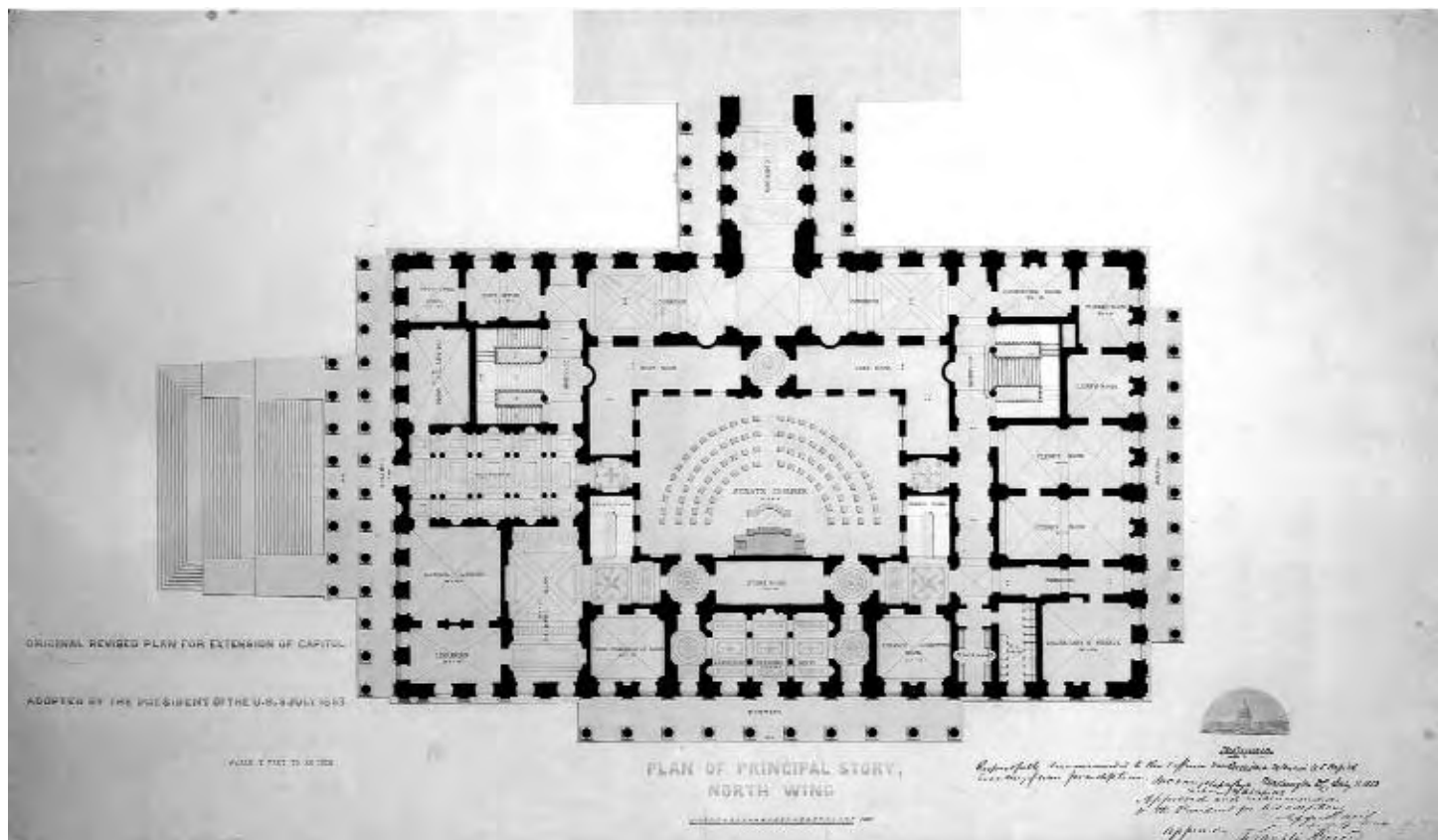
The *Washington Sentinel* disagreed on the grounds that it was foolhardy to assign engineers to civil works projects when there was a critical shortage of engineers to carry out military projects. The *Sentinel* particularly argued that Meigs's supervision of the Capitol Extension was contrary to the original legislation and cited an 1824 law that allowed the Army to hire civilian engineers when its workload required extra expert labor.⁴⁶

In spite of the controversy over military control of civilian projects, Meigs took over the writing and managing of all contracts for materials and labor from Walter, while the architect retained his responsibilities as the Capitol's designer. With Meigs as the "engineer in charge," a working relationship was established that became the model for the design and construction of the government's post-Civil War buildings in Washington. Meigs's



Montgomery C. Meigs
Office of History, Corps of
Engineers

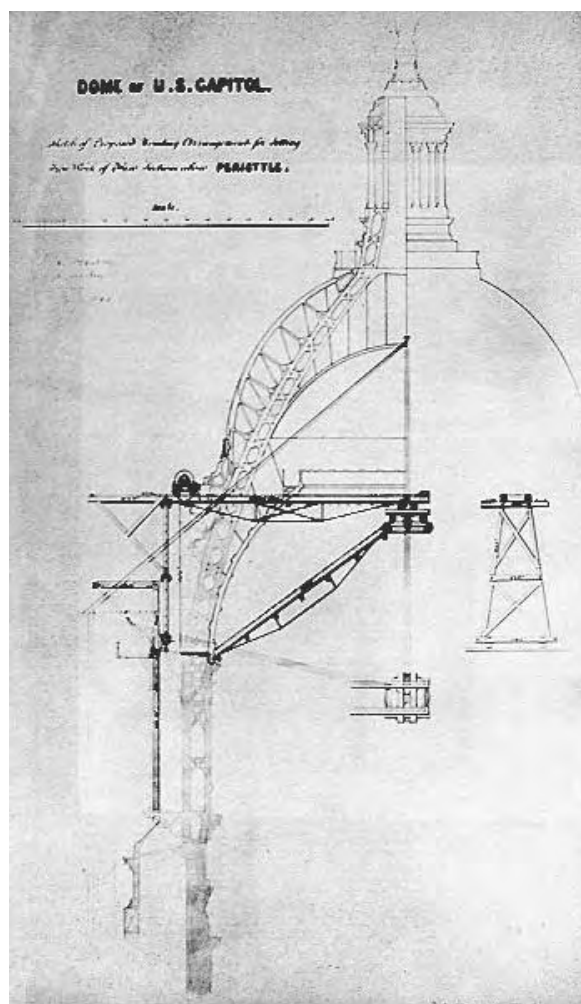
Meigs combined exceptional mental gifts, physical stamina, and an indomitable will—characteristics that made him the Corps' most colorful personality on the Washington scene for more than three decades. He was "high-tempered, unyielding, tyrannical towards his brothers, and very persevering in pursuit of anything he wishes" at the age of six, according to his mother. Oversight of the Capitol's extension might have been full-time work, but during the 1850s Meigs also was in charge of the Washington Aqueduct, extensions to two other major government buildings, and a score of lesser projects. Descended from a Revolutionary War General, Meigs was born in Augusta, Georgia, on May 3, 1816, the son of a Yale-trained physician, and the grandson of a Yale professor. Meigs was raised in Philadelphia and at the age of fifteen entered the University of Pennsylvania while awaiting an appointment to West Point. He graduated fifth in his 1836 class of forty-nine cadets, was commissioned an officer in the Corps of Engineers, and began the typical round of two- to four-year assignments by surveying the Mississippi River followed by building forts on the Great Lakes. By 1839 Meigs was in Washington serving on the Board of Engineers for Atlantic Coast Defenses where he married Louisa Rodgers, daughter of Commodore John Rodgers of the U.S. Navy. They lived in the Rodgers house on H Street, a short walk to the War Department and St. John's Episcopal Church, of which they were members. After other tours of duty, in 1852, Totten called Meigs back to Washington to survey the best route for Washington's aqueduct. Except for a few months in 1859 and 1860, Meigs spent the remainder of his career in Washington.⁴⁷



instructions gave him wide latitude. “As upon you will rest the responsibility for the proper and economical construction of these buildings, you will consider yourself fully empowered to make such changes in the present administration as you may deem necessary, and to regulate the organization thereafter as your experience may dictate.” Meigs might have taken this opportunity to fire or replace Walter, but he did not do so. Meigs’s first assignment under orders was to reexamine the foundations, the source of charges brought against Walter. At the same time he and Walter collaborated on a major change in the wings. Walter had placed the chambers on the west sides of the wings for views over the Mall and city; Meigs suggested moving them to the center of each wing. This improved circulation between them and congressional committee rooms, and allowed the chambers to be sunken wells with public galleries on all sides to ensure acoustical quality. Meigs’s arrangement meant illuminating the rooms with skylights, the entire design already suggested in the Abert-Strickland scheme of 1843. Meigs claimed

Plan of the principal story of the north wing, with the central chamber separated from committee rooms by a wide corridor
 Architect of the Capitol, 74028

*we obtain a pleasanter light, ample for all useful purposes, as proved by its adoption in all the best constructed picture galleries. We also exclude the sounds of the exterior, which, saturating the air, as it were, distract the attention, and even overpower the voice we wish to hear....Open windows for hearing will be worse than closed ones; they not only let irregular, disturbing currents of air in, but they let the voices out.*⁴⁸



*Sketch of Meigs's arrangement for
hoisting the cast-iron pieces of
the new dome*

Library of Congress, Prints and Photographs
Division, LC-USZ62-88372

***“I do not see why a
republic richer than the
Athenian should not rival
the Parthenon in the front
of its first public edifice.”***

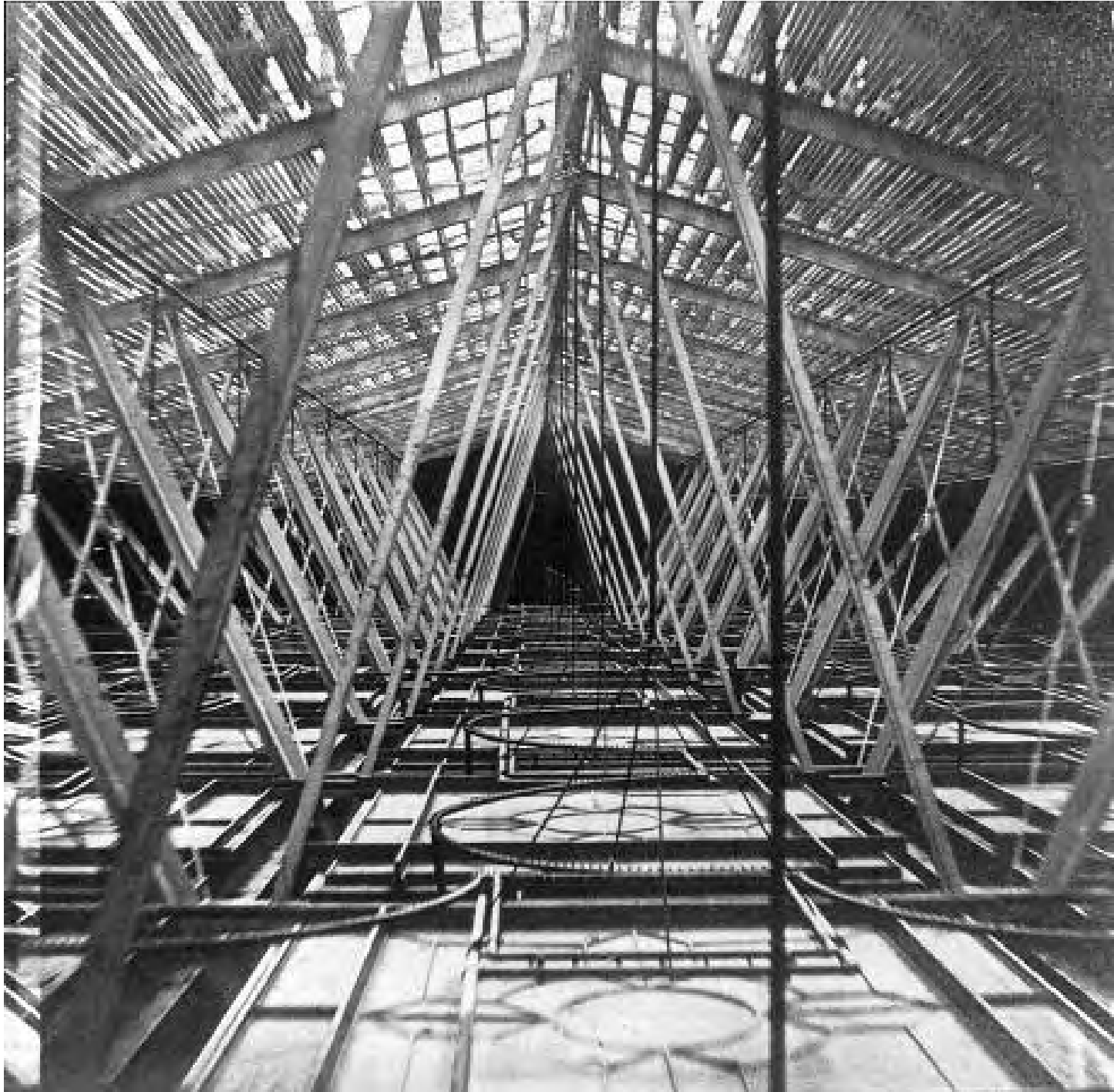
Meigs's revised 1853 plan included two monumental imperial marble staircases per wing, “the most stately in the country and when embellished with our beautiful native marbles,” Meigs claimed, “will, I trust, compare favorably with any abroad.” These staircases were primarily to take visitors to the public galleries, and their Victorian splendor reflected the contemporary taste of a newly rich country. Meigs's reports describe the new plans “in terms of richness, luxury, and elegance, reflecting the administration's determination that the Capitol extension” be comparable to contemporary European public buildings increasingly being visited by congressmen, cabinet officers, and high government officials.

Walter continued to control the design of the Capitol's exteriors with one exception. Meigs suggested including pediments above the east porticoes of the wings to match the central pediment above the portico that led to the rotunda. These pediments were to be filled with sculpture, and Meigs chose the artists, suggested appropriate themes to them, critiqued their work, and ensured they were paid.⁴⁹

In July 1853 Meigs wrote Edward Everett (a former president of Harvard as well as former congressman and governor of Massachusetts) asking for recommendations for sculptors; Everett recommended Hiram Powers and Thomas Crawford. In August 1853 Meigs wrote Crawford, who like some other contemporary American sculptors, lived and worked in Rome. “The pediments and doorways should be part of the original construction of the building, and

I do not see why a republic richer than the Athenian should not rival the Parthenon in the front of its first public edifice.” Meigs cautioned Crawford that complex allegories were not acceptable to the American public and Crawford responded with a design for the Senate wing's pediment titled the *Progress of Civilization*. Crawford's central statue allegorized America while twelve flanking figures represented the Euro-Americans in appropriate dress bringing European civilization to the new world and a Native American family in great sorrow. Once the Capitol's dome was underway, Meigs turned again to Crawford for a figure of *Freedom*.⁵⁰

Meigs's attention to construction details was legendary. When he noticed that windowsills on the eastern side of the south wing were a little more than an inch higher than those on the west, he had it corrected. His professional logs and personal journals record such daily minutiae as the cost of laying one thousand

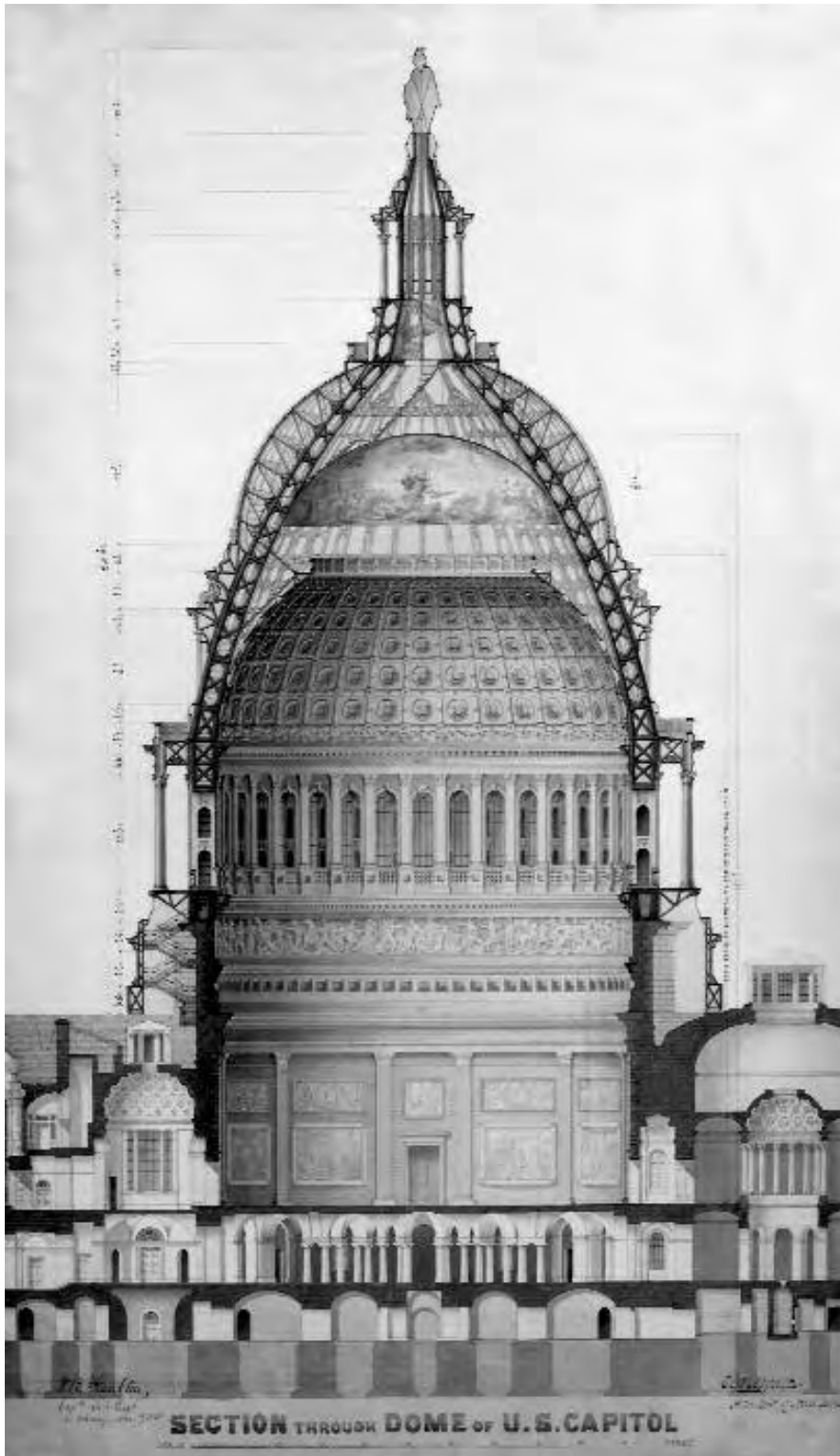


bricks (\$4.07), the number of government employees and contractors' workmen per day, and the progress of minor construction details. Obtaining good quality materials, especially bricks in sufficient quantities, was an ongoing problem and the Capitol's letter books attest to Meigs's visits to quarries and brickyards along the eastern seaboard and his rejection of shoddy products.⁵¹

Meigs was particularly anxious to use America's richly veined native marble and pursued sources at the same time Army (and Navy) Engineers were testing their strength

Roof over the House of Representatives' chamber, with Meigs's glass roof suspended by a truss system he designed

Library of Congress, Prints and Photographs Division, LC-USZ62-62170



Thomas U. Walter and Capt. W. B. Franklin, "Section through Dome of U.S. Capitol," Dec. 9, 1859. Both the trusses and the dome's exterior and interior decorative parts are made of cast-iron.
Architect of the Capitol, 74001

and durability for general use. It was not solely the Capitol's stability and construction technology, however, that Meigs wanted to his credit, but its place among the world's great buildings. He argued early in 1854 that the 100 new exterior columns should be monoliths cut from single pieces of stone, a subtle but effective aid to the appearance of stability, but, more importantly, a rare architectural achievement in Europe. Steam engines to cut monoliths from quarries, steam engines to convey them to the site, and steam engines to hoist them in place made a once vastly expensive architectural luxury perfectly possible; Meigs convinced Congress to bear their extra cost, double that of shafts composed of individual drums.⁵²

In 1854, the enemies of the "military rule" at the Capitol questioned Meigs's competency as the Capitol's design partner, but not his abilities as an engineer, at a time when radical changes in national taste were occurring. Representative Richard H. Stanton of Kentucky, in particular, was very outspoken about preferring Walter's "refined" taste to the opulence, even garishness, that Meigs was introducing in highly colored marble, tiles, and fresco

paintings. Such enmity also was motivated by congressional power struggles and partisan politics, a constant factor throughout the Capitol's history of construction beginning in 1793. Walter himself was initially delighted with the division of responsibilities between architect and engineer and admired Meigs. He wrote his father-in-law on June 20, 1854:

*The Captain is as noble a man as the country can produce, and he is better fitted for his post than any one they could find whether soldier or civilian, and I most sincerely desire that he may not be removed; such a thing would be a disaster for the country in general and me in particular—you have no idea what a luxury it has been to me during the past year to be able to devote myself to the legitimate professional duties, and be freed from the annoyances of contractors, appointments, disbursements, and the like, all of which take time, unhinge the mind, and create an army of enemies.*⁵³

From his youth, Meigs was part of the government and he understood the ways of politicians and the bureaucracy and how to manipulate the one and navigate the other, while Walter was often at the mercy of both. Both men had their friends and enemies in Congress and often that was the arena where differences of taste and credit were fought.

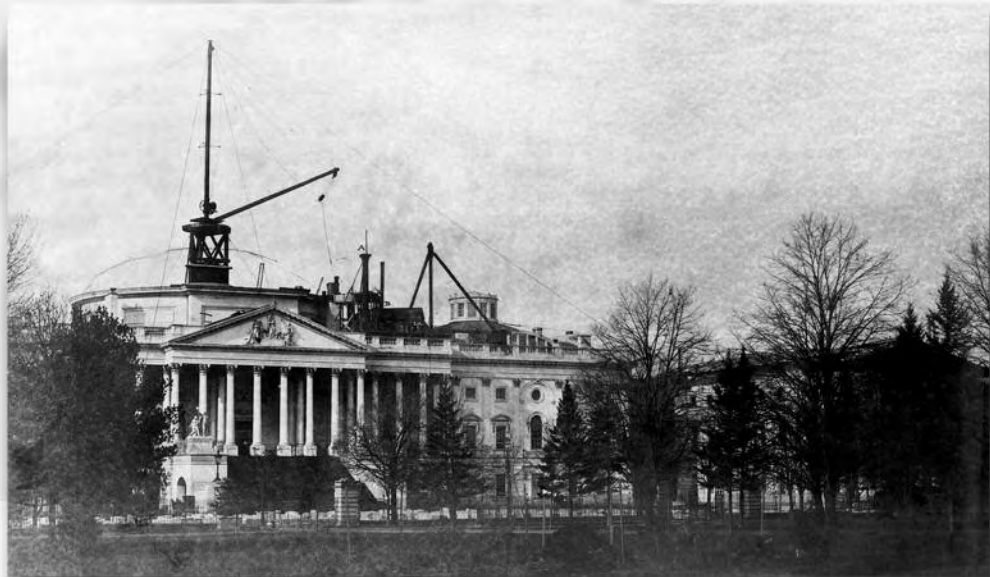
In May 1854 Walter began working on a new dome, from the outset planned to be built of cast-iron. He excited Congressmen with spectacular drawings—one seven feet long—and Meigs regretted that he did not have a larger part in its design. On December 26, 1854, he recorded in his diary: “I think the sketch I have made is a better outline than the one Mr. Walter and myself settled upon before, and I wish to have had something to do with this design myself. I can make a little greater height and more graceful outline and a very noble and beautiful interior arrangement.”⁵⁴

Meigs’s journal entry for December 29, 1854, indicates the kind of suppressed hostilities between architect and engineer that later broke out into open warfare.

*I showed Walter today my sketch for the dome....He was very decided in his opinion that his is better but offered to have both worked up so that they could be [compared]. It was evident that he is disgusted that I should attempt such a thing as design a dome. The arrangement of the rooms is mine. The form of the ceiling is mine. The style of decoration is that which I directed....He has not a dome in the building. I have introduced many. So that, in fact, the design is quite as much, if not more, mine than his....*⁵⁵

Meigs acted speedily in February 1855 to ensure that both houses of Congress voted to place the dome’s construction under the Corps of Engineers, it not having been

“The Captain is as noble a man as the country can produce, and he is better fitted for his post than any one they could find whether soldier or civilian....”



January 1856



1857



March 4, 1861

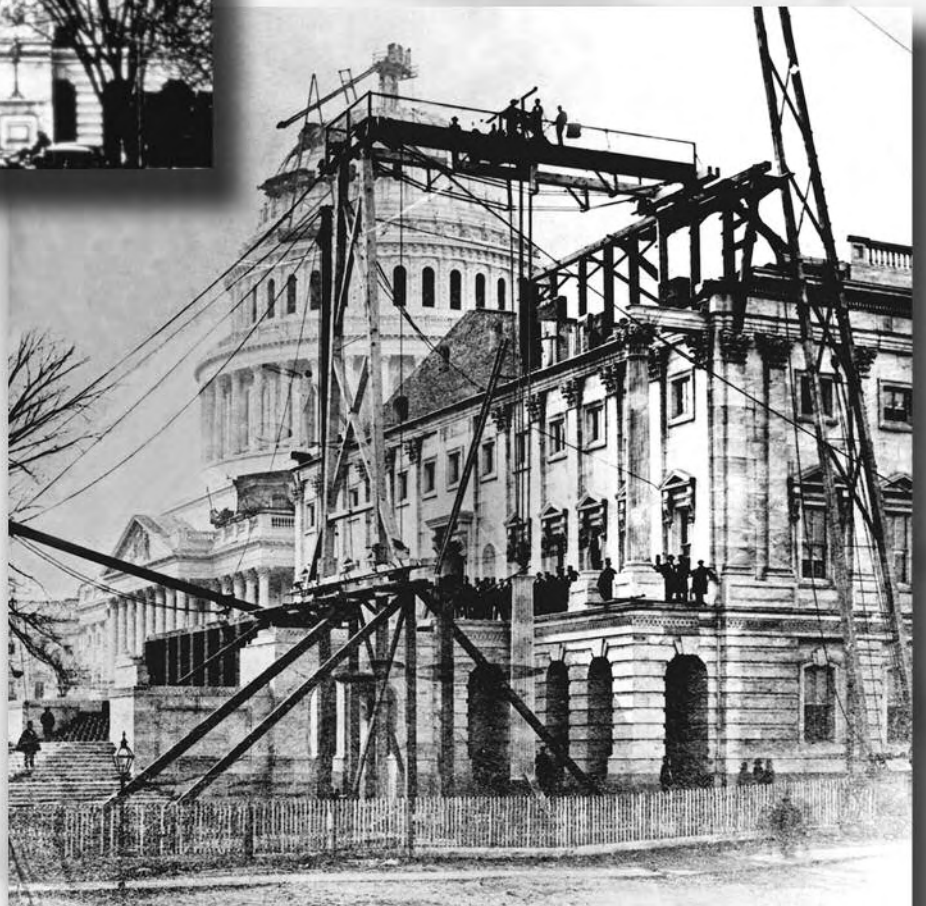
*Architect of the Capitol, 5002
Architect of the Capitol, 79256
Picture History, 1860.0143*



ca. 1861-62

ENLARGEMENT OF THE CAPITOL DOME

Partially completed for President Abraham Lincoln's first inauguration on March 4, 1861, construction continued during the Civil War. By January 1856 the old dome had been removed in preparation for construction of the new, larger dome. The 1857 photograph shows new iron work projecting from the support wall of the old dome. This new iron work would support the peristyle of the new dome.



November 1862



*Tholos and Statue of Freedom
of the New Dome of the Capitol*

*Library of Congress, Prints and
Photographs Division, LC-USZ62-38881*

part of the original legislation for the Capitol Extension. In order to get the greatest exterior width at the dome's base, Meigs suggested embedding iron brackets in the existing octagonal brick drum to support a cantilevered iron ring from which thirty-six columns would rise. Meigs designed a special scaffold with a triangular base to avoid a weak spot in the center of the rotunda's floor, later raising a mast and boom powered by a steam engine that Meigs fueled with wood from Bulfinch's dismantled outer dome. This structure made it possible to raise the large iron pieces efficiently and economically, a great savings in time. Meigs kept up to date with European and American advances in technology and was quick to apply what he learned to projects under his direction. Because of concern about the weight of the much larger new dome, the old dome was weighed as it was dismantled, the cast-iron dome found to weigh only twenty-percent more than Bulfinch's dome. When the original congressional appropriation of \$100,000 was deemed inadequate, Meigs claimed that he repeatedly refused to estimate the new dome's cost based solely on Walter's elevation drawing; the dome eventually cost \$1,047,271.⁵⁶

Within two months of Congress authorizing the new dome, Meigs asked sculptor Thomas Crawford to sketch a figure for its summit, an element present on Walter's drawings but its subject undefined. On May 11, 1855, Meigs wrote the sculptor: "We have too many Washingtons; we have America in the pediment, Victories and Liberties are rather pagan emblems, but a Liberty I fear is the best we can get." Crawford's design was received on July 12, its subject "Freedom Triumphant in Peace and War," its emblems consisting of a sword, olive branch, and shield of the United States, all elements readily comprehensible to the American people. Meigs returned the design asking for a base to be added that would fit the tholos on which it was to stand; Crawford's photograph of his revised sketch maquette arrived in January 1856, with the figure wearing a liberty cap, a Roman emblem of freed slaves that had been revived first during the American Revolution and then the French Revolution. Secretary of War Jefferson Davis objected to this addition to the statue, arguing, "history renders it inappropriate to a people who were born free and would not be enslaved." In January 1856 Meigs noted in his diary that despite Davis's objection to the liberty cap, "he leaves the matter to the judgement of Mr. Crawford," who was sent Davis's letter and decided to give "Freedom" an eagle headdress.⁵⁷

Marble in a great variety of colors and patterns from many American quarries were the Capitol extension's most expensive elements and Meigs had complete

control over their choice and contracting for them. Although marble floors originally had been specified, Meigs substituted English Minton encaustic tiles—highly patterned and very colorful, as well as being very durable. He substituted iron door and window frames for marble because they could be made more rapidly. During the nine years that Meigs oversaw the Capitol’s construction, he was always conscious of applying new technologies to save time and money without sacrificing the quality of construction. He used steam power whenever possible to replace man-hours. However, cost savings in these areas was more than balanced by Meigs’s expenditures on beautifying the Capitol according to his (and currently popular) taste, all duly authorized by Congress.⁵⁸

Meigs began seeking artists to decorate the Capitol’s interiors in 1854, and in January 1855, when the Roman expatriate fresco painter Constantino Brumidi came to the Capitol seeking work, Meigs invited him to paint a lunette in his office, the subject being the *Calling of Cincinnatus from the Plow*. Meigs considered this an appropriate theme because it fused the Revolution’s military and civic history in an allegory cast in the timelessness of classicism. The Society of the Cincinnati had been founded in 1784, with George Washington its first president, to honor American military officers who served their country during the Revolution. Contrary to Crawford’s realistic sculpture for the Capitol, Brumidi carried out under Meigs’s direction great cycles of paintings in which American historical events were cast in the visual language of traditional European allegories. The architectural and decorative frameworks in which they were placed were derived from Italian Renaissance buildings, considered to be the acme of human civilization by Meigs’s generation. Some of Brumidi’s paintings were portraits of actual people engaged in real events, but the majority, including the grisaille frieze and the *Apotheosis of Washington* in the rotunda, used the traditional allegorical language drawn from ancient mythology as more appropriate to the European origins of the Capitol’s architecture.⁵⁹

Meigs also received a great deal of credit during the nineteenth century for his engineering work on the Capitol Extension. Because of frequent night sessions in the House of Representatives and because of its large size, the chamber was lit by an impressive array of 1,260 gas burners on the ceiling containing forty-five thousand individual jets. The jets reportedly ignited in twenty seconds when the system was first used on December 2, 1857. Meigs also was responsible for the Capitol’s unique steam heating system, “thought to be superior to anything of the kind ever invented.” Air was heated

*“...it is the most
vulgar room I was
ever in.”*

as it passed over “seven or eight miles” of steam pipes and dispersed to the Senate chamber and committee rooms.⁶⁰

When James Buchanan was sworn in as president in 1857, he appointed Virginia Governor John B. Floyd as secretary of war. Meigs’s championing by the War Department gradually came to an end because Floyd saw the Capitol’s large workforce as an opportunity to exercise political patronage. Meigs repeatedly refused at first hints and then direct orders to replace his trusted and experienced workmen with those suggested by Floyd. At the same time, competition between Walter and Meigs for credit of the Capitol’s design erupted over the issue of the new Hall of Representatives. Walter complained that Meigs had undertaken all of its decorations without consulting him and that “it is the most vulgar room I was ever in.” Meigs wrote the *National Intelligencer* on December 7, 1857, promoting his design.⁶¹

*The style is new in this country where our public buildings generally, through the poverty of the public purse or perhaps the greater poverty of the architect’s taste, starve in simple white-wash. This, new in this country, rich and magnificent decoration, naturally, when first seen excites surprise. The colors are so rich, so various, so intricate, so different from anything seen before, that the impression is that it must be, what? Gaudy? But what is gaudy? Are the colors of the autumnal forest gaudy?...Let not the noisy babble of ignorance forestall public opinion on its merits.*⁶²

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On November 1, 1859, Floyd relieved Meigs of his duties at the Capitol. Meigs recounted in his journal a particularly acrimonious meeting with Floyd on September 15, 1858.

He said that he thought the skill and taste of Mr. Walter could not be spared, that he supposed I would not be ready to assume a sufficient skill as an architect to complete the building without him or someone in his place.

I told him that he was mistaken. I assumed to be able to complete it as well as Mr. Walter or any man living, that it was now mine, the exterior alone being Walter’s, and that not entirely his; that the interior was my design, Mr. Walter having been the draftsman only, to execute such drawings as I directed; that the design and construction of the halls for legislation were entirely mine and to me alone was due the success of the building its great object. That the reputation which I had thus won, Mr. Walter endeavored to

*rob me of, etc. That I was entirely unfitted to take the position he proposed, of a mere executive agent, a disbursing officer, to carry out the designs of Mr. Walter or any other architect. That I had made a reputation which neither Walter nor any other man could take from me.*⁶³

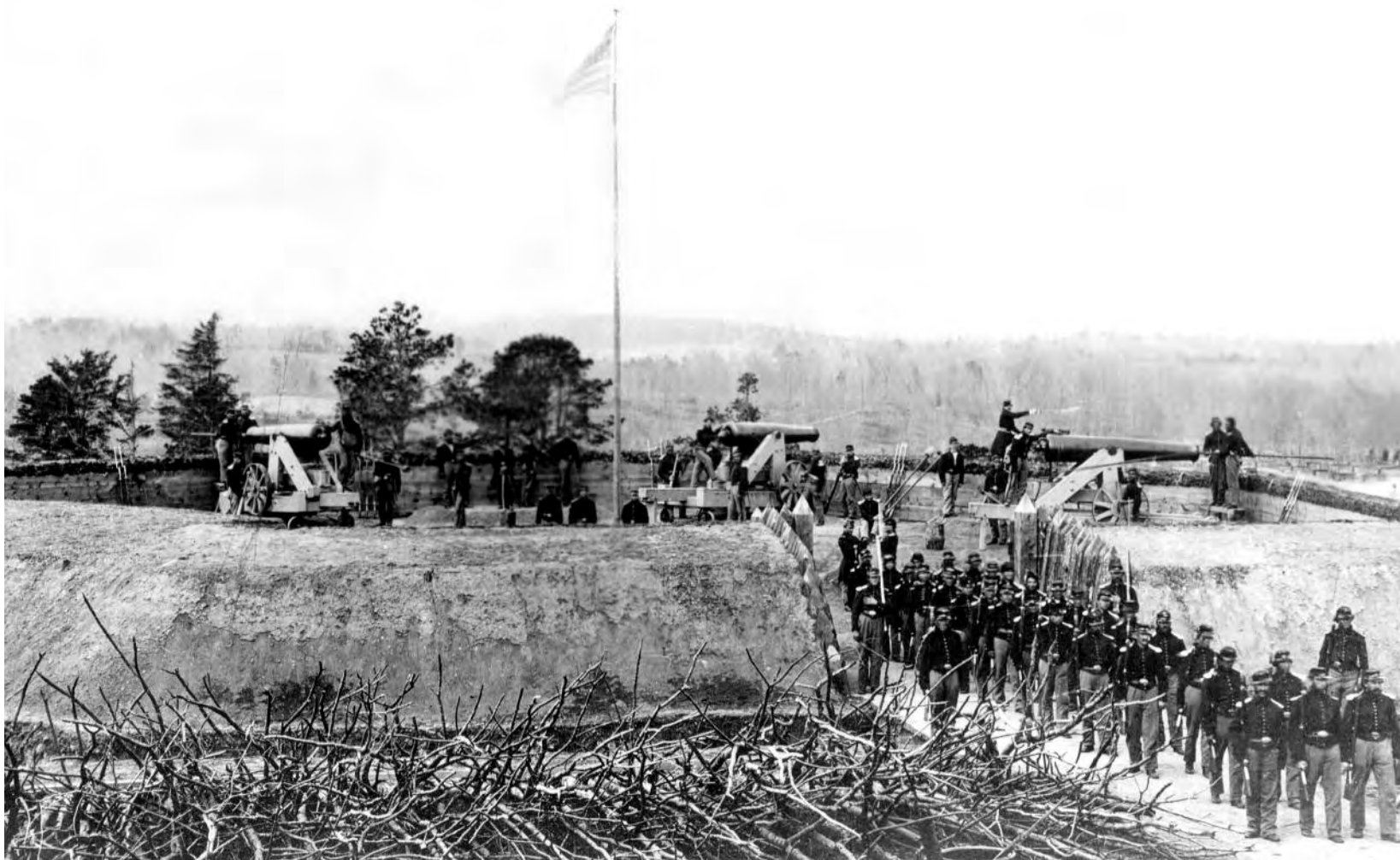
Meigs was more extreme in his attitude towards architects than other Corps engineers who worked as superintendents of construction on post-Civil War buildings in Washington. His exceptionally strong ego combined with his rightful intellectual ownership of many design decisions at the Capitol led him to believe that his artistic contributions were not being properly recognized. Meigs, as many West Point engineers of his generation, was trained to solve architectural problems including issues of design; recognition of his own considerable abilities as a designer and acutely conscious of contemporary aesthetics so different from those of Walter's more sedate generation, drove him to adopt this position. Seemingly, Meigs was unable to recognize the differences between his education in design, which focused on literal reinterpretations of prototypes (but innovative solutions of technical problems), and the architects' education, which emphasized the transformation of traditional historical archetypes in the creative process. Walter, one of the founding members of the American Institute of Architects, began a campaign to assert the supremacy of architectural design over the mechanics of coordinating the construction of such a complex building. He was unwilling to recognize Meigs's actual architectural and design contributions; personal jealousies between the two men became institutionalized during the following decades when Congress dictated that architects design public buildings and Army Engineers build them.

Throughout his private journal kept during the 1850s, Meigs lamented that his captain's salary was barely enough to support his family, certainly not enough to entertain as he felt his position required and merited. Despite his grumbling that he could earn a much higher salary as a civilian engineer, Meigs remained a military man to the end of his life. Two factors offset his desire for a larger salary: the opportunity to have so much control over such momentous projects as the Capitol Extension and the Washington Aqueduct, and the entrée into Washington society that his position and family connections afforded him. It was not until well after the Civil War that General Meigs was given the opportunity at the Pension Building to fully exploit his talents as both engineer and architect in a highly individual work of architecture.⁶⁴

“I had made a reputation which neither Walter nor any other man could take from me.”



THE WINDER BUILDING, AT THE CORNER OF 17TH AND F STREETS WEST OF THE WHITE HOUSE, WAS BUILT IN 1847-48 BY WILLIAM H. WINDER, WHO LEASED MOST OF THE SPACE TO THE U.S. GOVERNMENT. THE CORPS OF ENGINEERS MADE IT THEIR HEADQUARTERS FROM THEN UNTIL 1889. THE BUILDING, SEEN HERE IN THE CIVIL WAR ERA, HAS BEEN SUBJECT TO VERY FEW ALTERATIONS AND STILL STANDS TODAY.



THE CORPS IN CIVIL WAR WASHINGTON

The Corps of Engineers contributed extensively to the physical makeup of the district during the Civil War.⁶⁵ At the end of May 1861, Union troops occupied defensive positions on the Virginia side of the Potomac, and there established the first defensive works to protect the capital from southern military threats. After the July 1861 Union defeat at Manassas, greater emphasis was placed on the thorough planning of a protective system for the city. The next month Major General George B. McClellan assigned engineer Major John G. Barnard to be chief engineer of the city's defenses, in charge of construction of a planned ring of batteries, redoubts, lunettes, and forts. Barnard began by protecting major roadways, first on the Arlington Heights, then on the roads connecting the city to towns in Maryland to the north. By the end of 1861, forty-eight defensive works protected Washington—twenty-three in Virginia, seventeen on the northern sweep from the Potomac to the Anacostia, and eleven to the southeast and south of the Anacostia. Much of the labor was supplied by soldiers, supervised by the dozen or so engineer officers assigned to the work. As the war progressed, the Army Engineers came

Fort Stevens in the Northwest section of the district. Engineers built the fort to defend Washington from attack along the 7th Street Pike (now Georgia Avenue). On July 11, 1864, confederate Lieutenant General Jubal Early's forces attacked that section of the city's defenses but were driven off.

National Archives no. 66-DC-18-4



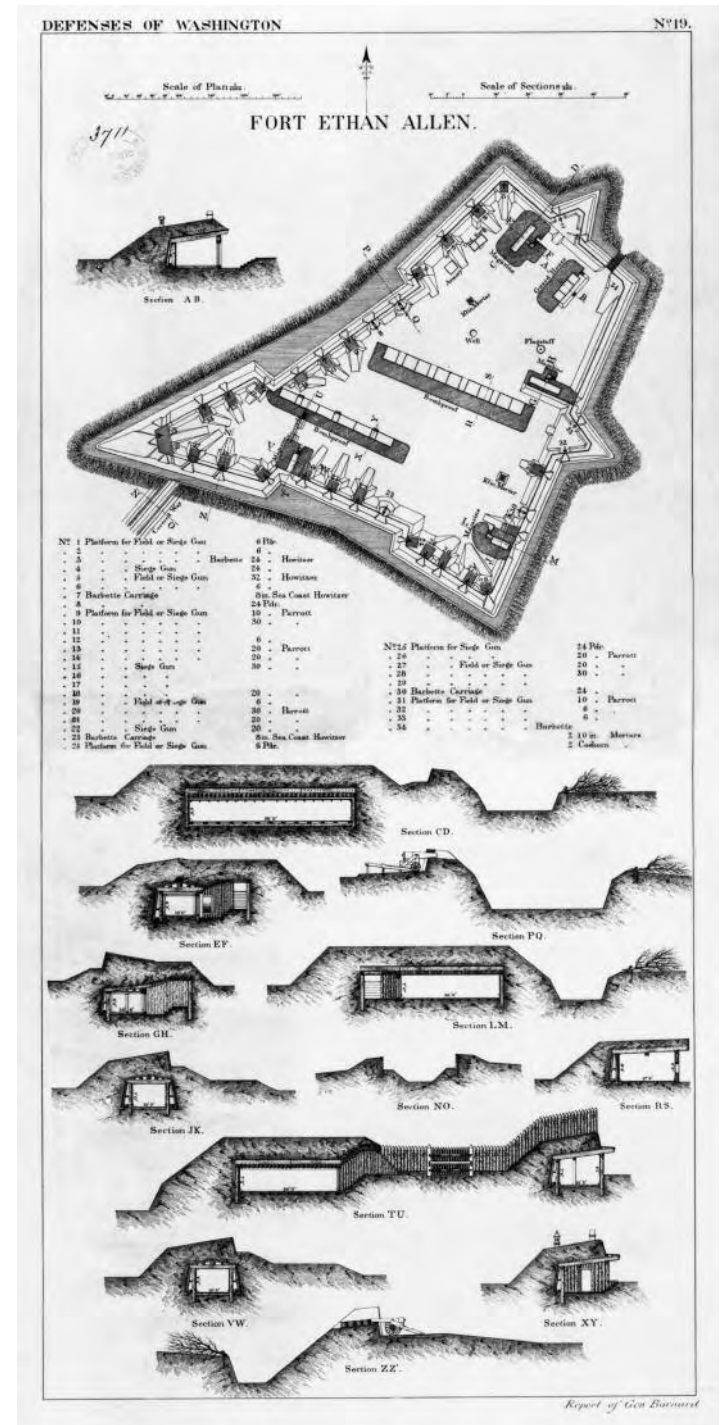
*Fort Totten in the northeastern
part of the District of Columbia*

National Archives no. 111-B-376

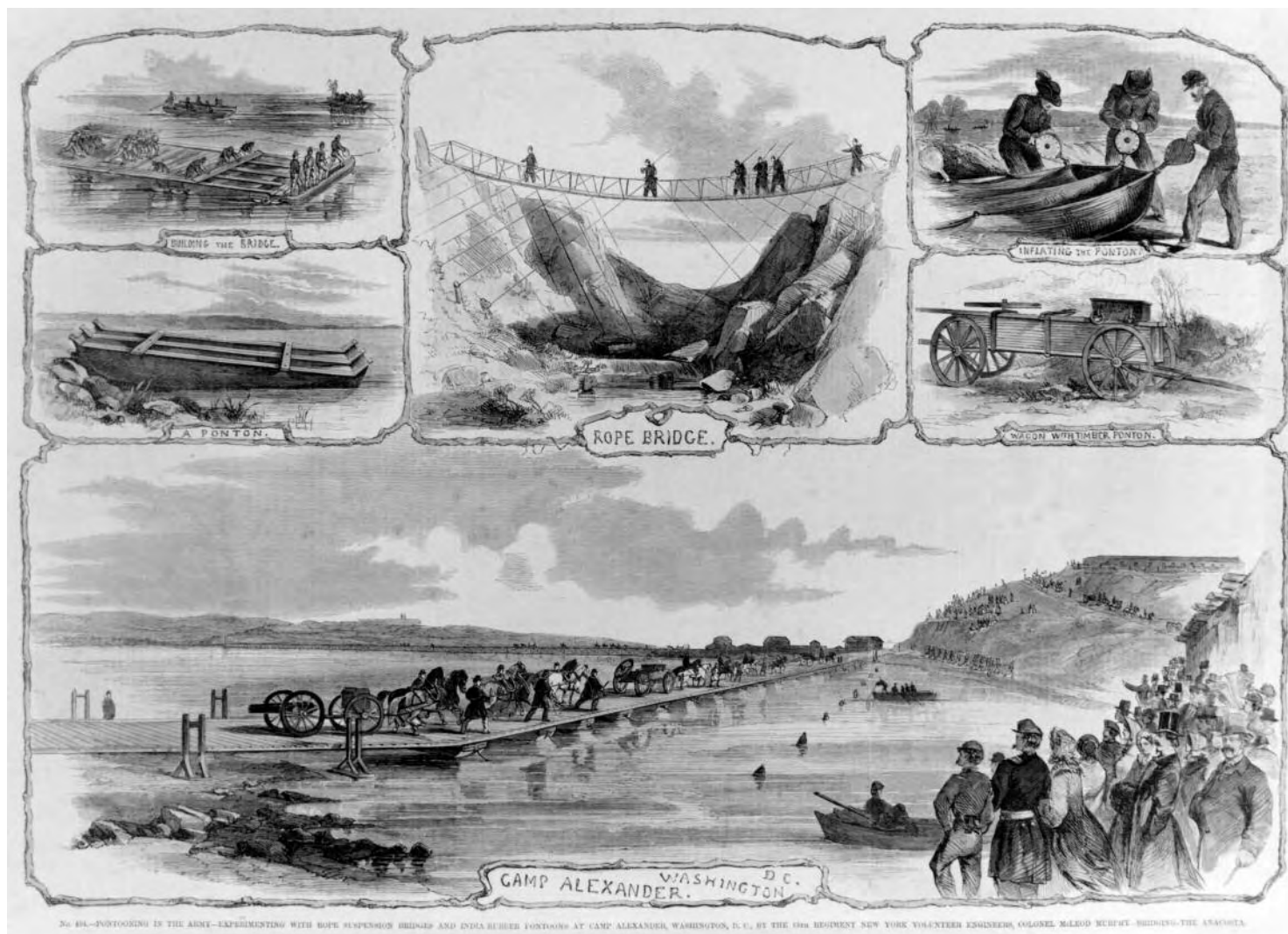
to rely upon numerous civil engineers and civilian overseers. A pair of civil engineers, previously employed on the Aqueduct, directed substantial work done in 1863: "They exhibited great zeal and intelligence, and soon mastered all those branches of military engineering which concerned their duties of construction. They were required to execute the plans prepared in the office of the chief engineer, to exercise a close supervision over their respective divisions, and generally to act as administrative officers in the details of the work."⁶⁶ As subsequent military campaigns moved soldiers to the field, Barnard also relied increasingly on hired labor. As he wrote after the war, "Details of troops were used whenever (and to the fullest extent) practicable; but this force was variable and uncertain, generally furnished with reluctance by the commanding officers, and comparatively inefficient when furnished....During the year 1863 large details were drawn from the convalescent, stragglers, and deserters' camps south of the Potomac, and made up in numbers what they lacked in individual efficiency."⁶⁷

The initial detached line of forts was only later filled in and strengthened with supporting fortifications. Congressional appropriations in 1862 could not be used to start new works, although reevaluation of the defenses of the capital city came after the Battle of Antietam in October. A commission created by Secretary of War Edwin Stanton reported that twenty-five thousand infantry, nine thousand artillerymen, and three thousand cavalry were needed to defend the city adequately—plus another twenty-five thousand additional men to act as a mobile force outside the ring of defenses. The commission also called for changes to the existing works, the creation of half a dozen new forts, and additional shore defenses. Stanton's commission was well positioned to help the secretary of war gain congressional approval for expanded defenses: it included Chief of Engineers Totten and Quartermaster General Meigs, in addition to W. F. Barry, Chief of Artillery; G. W. Cullum, chief of staff to the General-in-Chief; and J. G. Barnard.

Despite labor and funding difficulties, by the end of 1863 Washington possessed 60 forts, 93 batteries, and 837 field guns. Rifle pits wide enough for two ranks of soldiers tied the ring of defenses together. The campaigns of 1864 removed both troops and guns from Washington. Lieutenant Colonel Barton S. Alexander replaced Barnard, reassigned to General Grant's staff as his chief engineer. When Confederate Lieutenant General Jubal Early moved on Washington in July—the only substantial fighting the city actually saw—only nine thousand soldiers manned the defenses. The engineers worked to improve and perfect the city's defensive works through the end of the war, although no major threat followed Early's unsuccessful campaign. By April 1865 the Corps had overseen the use of \$1.4 million to construct twenty miles of rifle pits and thirty miles of military roads serving more than fourteen hundred gun emplacements in sixty-eight forts and ninety-three batteries. Among the roads was a five-and-a-half-mile stretch connecting Fort Sumner along the Potomac to Fort Stevens to the east of Rock Creek, “a very excellent road, thoroughly drained by side ditches and with substantial bridges and culverts...to



Plans for Fort Ethan Allen on the western side of the Potomac River, one of the many earthen and wood fortifications built to defend Washington during the Civil War
Office of History, Corps of Engineers

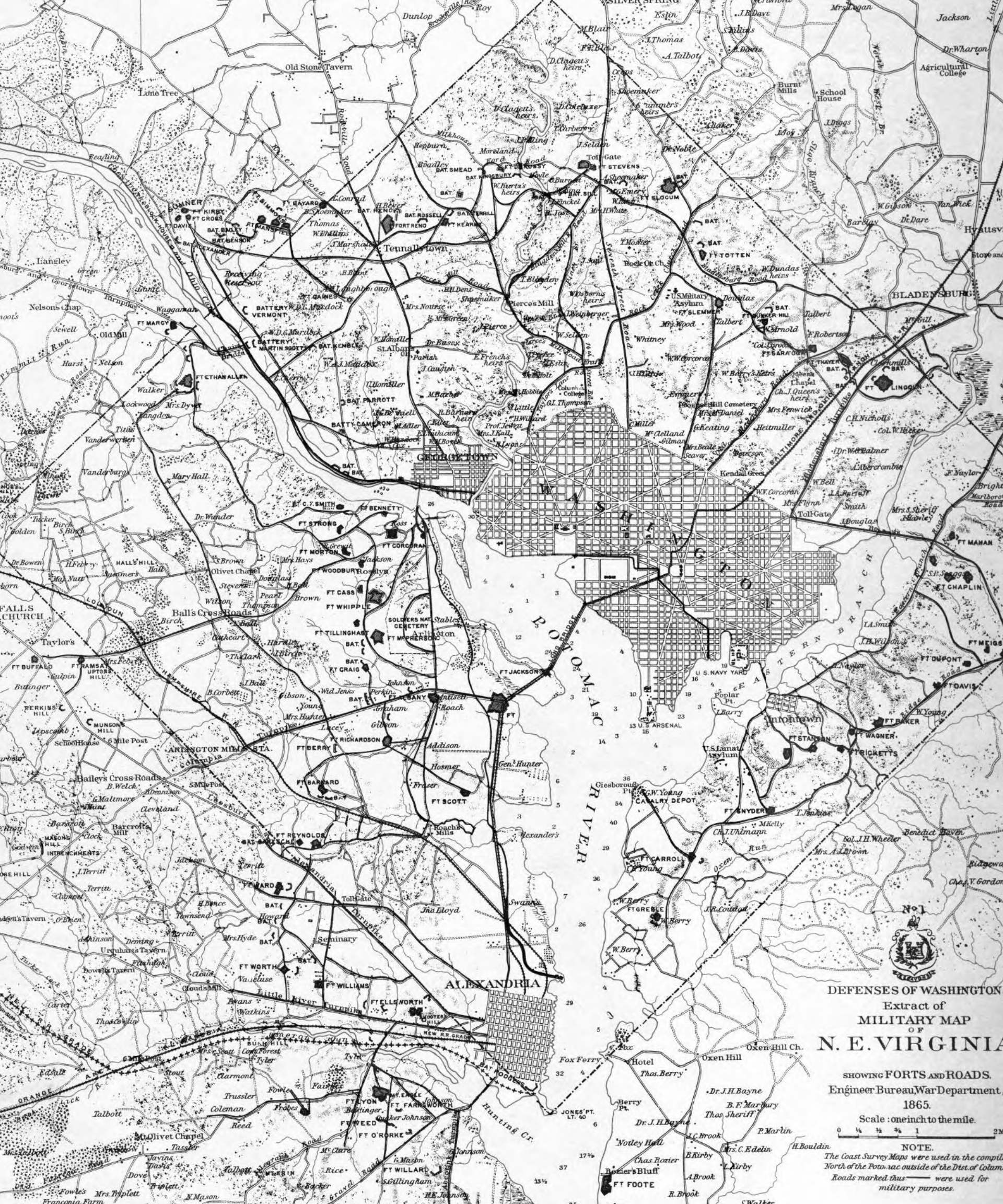


Lithograph of the 15th New York Volunteer Engineers experimenting with rope suspension bridges and India rubber pontoons and ponton bridges at Camp Alexander on the Anacostia River during the Civil War
Office of History, Corps of Engineers

which was given a width of forty-five feet and a full, rounded surface.” Within a few years after the return of peace, the defensive works—which had briefly made Washington one of the most heavily fortified cities in the world—had been abandoned, although some of the roads and parks on the grounds of former forts became lasting contributions to the city.⁶⁸

OPPOSITE PAGE: ENGINEER MAP
OF THE DEFENSIVE POSITIONS
SURROUNDING WASHINGTON
DURING THE CIVIL WAR

Office of History, Corps of
Engineers, Maps



DEFENSES OF WASHINGTON
Extract of
MILITARY MAP
OF
N. E. VIRGINIA

SHOWING FORTS AND ROADS.
Engineer Bureau War Department.
1865.

Scale: one inch to the mile.

NOTE.
The Coast Survey Maps were used in the compilation.
North of the Potomac outside of the Dist. of Columbia
Roads marked thus — were used for military purposes.